

AMAZING STORIES



June, 1937
25 Cents

MURDER BY ATOM

by

JOSEPH W. SKIDMORE

MILES J. BREUER, M.D.

GEORGE H. SHEER, B.S., E.E.



GENEVIEVE: "Why, Lucy, you're not leaving—the party's just begun."

LUCY: "You'd leave, too—I came with one of those 'it'* boys... the wrong kind of it..."

*Nothing spoils an evening, breaks up a pleasant association, or loses a friend so quickly as a case of halitosis (bad breath). Nothing conquers this condition so quickly as LISTERINE, the quick deodorant.

SHOOT YOUR MAN at Sunrise

BY JANE JONES

I DON'T care whether he looks like a Greek god, makes love like an Italian, or writes out a six-figure check for his income tax,—I say, shoot him at sunrise—or even earlier—if his breath is objectionable.

Too long have men gotten away with the idea that women should be grateful for their mere presence, without any consideration of what kind of presence it is.

In my opinion, a man whose breath isn't what it should be, is nothing short of a Grade A bore and nuisance... and should be so informed as adroitly as possible.

How to do it is a problem. After all, the subject is delicate. If hints do not work... if the power of suggestion flops miserably... you can, as a final resort, send him a Listerine ad—of course withholding your name.

Perhaps because of the heinousness of his offense, anonymity is justified. If after all this he still doesn't take the hint, dust off your revolver.

I know any number of women who feel as strongly about bad breath as I do and who, by a campaign of clever suggestions, have transformed walking nuisances into really agreeable suitors. A bow to Listerine for its aid in this matter.

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AMAZING STORIES

Science Fiction

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No. 3

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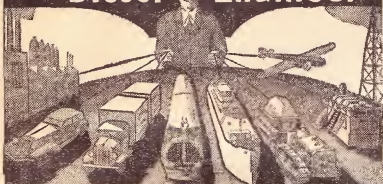
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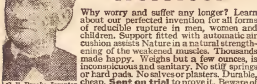
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T. O'CONOR SLOANE, Ph.D., *Editor*

Editorial and General Offices: 461 Eighth Avenue, New York, N. Y.

Extravagant Fiction To-day Cold Fact To-morrow

Elements

By T. O'CONOR SLOANE, PH. D.

THERE was a period many years ago when the world was supposed to be composed of matter which was specified as of three kinds, of solid, liquid and gaseous matter, of earth, water and air, to which was added a fourth element, fire. To the student of nature of the present day this seems a very crude way of expressing the world of elements in which we have our being; it amounts to reducing the number of the so-called elements from over ninety to four. The student of the present day has the ninety-three elements for his chemical elements, the physicist has electrons, positive and negative to build up his structure from, and both are inclined to consider the old time philosophers as dreamers. Yet while the old time students of the world around them had no knowledge of chemistry, probably not the slightest idea of a chemical

element, their conception of this habitat of ours was a very interesting picture of the world as we see it. If in this primitive division of the physical world we let the word fire indicate the luminiferous ether, the ancient division will be surprisingly near the modern conception of things. For fire must not be taken as the exponent of only flames, for there are lots of heat affecting our senses where there is no fire.

The disparity in number between solids and the other two divisions of matter of the first three divisions of matter is striking. The most casual consideration of what we see about us brings out the impressive abundance of solids in their variety of over ten thousand. In the earth we have any number of different minerals, and the vegetable world gives us many organic compounds. But if we come to the second of the ancient divisions,

to liquids, we find astonishingly few compared to solids, and the same applies to gases. It is fortunate for us that this is the case. For if we took the most obvious way of increasing the liquids matter on this earth of ours we would, as the most direct way, proceed to heat it so as to liquify the mineral matter. But life would perish long before the rocks would melt and become liquids. As for the gaseous elements of the old classification, the ancient philosophers were just as familiar as we are with one which they considered to be an element although it is a mixture—this is air. We know that it contains several gases besides the principal constituents, nitrogen and oxygen. And whatever stress we may lay upon the limitations of the knowledge of things among the ancients, we may in justice to them remember that it was only recently that argon was discovered in the air, and that neon as a good example of still more recent work may be cited, for that was discovered some years after argon was given a place in the list of elements. It is impressive to see what neon has done for commerce, as at first it was only a chemical curiosity. The multitude of presumably red tubes used for display are not red at all. The color is due to the ignited neon gas with which they are filled. It is modified by mixture with some other gas, if another color is to be produced. The gases are heated by the electric current. But it took us modern philosophers two thousand years to add a few gases to the list of our atmosphere's constituents, and since the beginning of time, man and the other animals have been inhaling, not only oxygen and nitrogen, but also carbon dioxide and argon and minute percentages of neon and other rare gases.

A few years ago it was an easy thing to give a definition of an element. The original conception of an element goes back some few centuries, but the modern separation of an element dates back to the beginning of the last century or rather to the end of the eighteenth century. This was the epoch of the discovery of the possibility of analysing compounds, and it led up to the making up the list of elemental constituents of matter, and year after year more elements were added to the list, until we had nearly ninety elements. And now we have ninety-three elements in our chemical table of elements. This gives over thirty times the classification of solids, liquids and gases of old times.

It is not many years ago since man thought that in the discovery of some eighty elements he had reached the end of his work and he devoted his energies to devising various methods of analysis of all sorts of substances. He was ready to believe that eventually the list of elements would be enlarged by the addition of more, but he felt that he was pretty near the end of discovery. The electrician meanwhile was working away in the development of his science, which seemed quite distinct from chemistry, but which eventually changed completely the aspect of the elemental constitution of matter. Just as the chemist had worked to enlarge his list of elements, and rated his advance over the philosophers of twenty centuries ago by the fact that they had only three or four elements to his ninety or more, the electrician had been working with the electron. He proceeded to formulate the combination of electrons as building up the whole world of matter. He had his negative electron held in its place or orbit by the positive electron, the

proton, because unlike attracts unlike in the electrical world. Almost all the weight was in the positive electron, called the proton, and by attraction of the proton the electrons were held in place. A very striking comparison may be made between the old time division of tangible substances into three elements, solid, liquid and gaseous, and the electrical constitution of the atom. If we take all matter to have its atoms and masses built up of electrons, we have fewer kinds of elemental substances than the ancients assumed. There are two kinds of electrons, all matter is built up out of electrons of only two kinds, so that instead of the three original forms of matter of the old times we have only two left to us—the electron and the proton.

There must have been great dissatisfaction with the old time idea of the three elements, solids, liquids and gaseous. It told nothing of the reason for the difference between different solids, as between iron and copper for instance, or between some rock and a metal. It seemed perfectly clear that there was something in the difference between the solids that was entirely unexplained by the theory. The same applied to the liquids. There was a difference between water and milk which was not explainable by anything the ancient philosophers knew. It is easy to make a list of the very few gases known to the ancient world. We do not know if they really knew of any of the gases except the mixture called air. They may have known something about carbon dioxide, for it is exhaled from some places in quantity. The famous Grotto dei Cane, as they knew killed dogs and smaller animals that ventured into it. But did they know that men could walk across it without being af-

fected? The heavy carbon dioxide gas was not of sufficient depth to reach his head. It was like a shallow pond.

They certainly did not know that this gas which killed animals in the famous grotto was present in the air which we breathe, and that of the air only about one-fifth operates to sustain life. They did not know that the gas so fatal to animal life was absorbed by plants.

WITH all the knowledge of the present day it is far from easy to give a definition of what is a real chemical element. In the days of alchemy men tried to convert lead or some inferior metal into gold. There is not the least doubt that much fraud was practised by those who claimed they could effect the transmutation of metals, and one of the developments of modern chemistry can be taken as the absolute denial of the possibility of doing this. But today it has been found that the possibility of transmutation seems to be looming in the future. Radium is constantly giving off emanations and there is no telling how near we are to effecting a transmutation change. One trouble in it is that as far as we can see the transmutation, if it ever is effected, will go the wrong way.

The French writers are fond of citing Lavoisier as the founder of the science of chemistry. His separation of oxygen from one of its compounds, from mercuric oxide, was a true analysis, the "unbinding" of a chemical compound. This achievement came a short time before the worst days of the French revolution. Lavoisier had been a "Farmer of the Revenue" as it was called. To him was intrusted the collection of the tax on salt. This gave a pretense to consider him an oppressor of the people, so he was

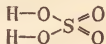
condemned to the guillotine. He was brutally told that the "Republic" had no need of chemists. But a few years later in the days of Napoleon, the supply of kelp, an imported seaweed from which sodium carbonate had been extracted, was cut off, and a chemist was imperatively needed to find a source of the sodium salt, the great requisite in the manufacture of soap. The problem of making the salt was solved by a chemist named Le Blanc, who established one of the greatest chemical industries of the world and died without reward. Priestly did his work almost at the same time with Lavoisier. His separation of oxygen was done in Pennsylvania, thus giving this country a claim to the foundation of modern chemistry. At once scientists of the next epoch worked out the analysis of many compounds and eventually over ninety elements have been discovered and their properties have been investigated with their combining weights and general features.

In the early days of chemistry, it was supposed that the work of investigation was completed with the discovery of the few elements. They may well be called few, for there are only ninety-three of them, and they make up the world as we know it. A very curious feature of the atoms of the elements is that many of them combine with each other in simple ratios, so that the atomic weights, which are relative, are in many of them expressible by one or two digits. In some elements decimal fractions appear in the atomic numbers, but the number of elements with integral one and two figure atomic weights is very striking.

Valencies from one to eight in number are assigned to the elements. This means that an atom will combine with

other atoms or atom to form a chemical compound. In so doing each of its valencies must be satisfied. When the last named feature obtains the compound is said to be saturated. Unsaturated compounds cannot exist. All this is simple and elementary. The power of combining was formerly expressed by assigning bonds to each of the elemental atoms, and these bonds could vary in number from one to eight. A relative weight was assigned to each atom, based on the analysis of the substance. These numbers gave the relations of the weights of the atoms. There was no idea of their being the real weights of the atoms. But they did give the relations of the weights of the atoms as accurately as the most exact analysis could go. The combining power of an element was expressed by this atomic weight, and by the theory of there being bonds every one of which had to be in combination with another bond. Thus oxygen had two bonds in its atom. Hydrogen had one. Therefore it required two hydrogen atoms to unite one oxygen atom, bond taking bond into combination. This combination gives the compound, water.

A good example of the bond system is the molecule of sulphuric acid. Hydrogen as we have seen is a monad, the name for an element whose atom has a single bond. Oxygen has two bonds as we have seen, and that makes it a dyad. Sulphur has six bonds in its atom and is termed a hexad. The formula of sulphuric acid is H₂SO₄, written as below by the bond system:



But all this while electricians were working away at the ultimate constitution of matter, applying most

ingenious experiments in physics to get closer to the constitution of the elemental atoms of matter. Some of the experiments led to negative results, but these told their story, just as the successful ones told theirs. Not very long ago chemists believed that the atom was the ultimate particle of matter. Now the ultimate particle of matter is taken to be the electron, the ultimate particle of electricity to express it simply. There is a negative electron, which is called an electron. Then there is a positive electron which is called the proton. The proton has weight, the electron, indicating the negative electron has hardly any.

Various numbers of electrons and protons combine to form atoms. The weight of the atom is in the protons. The central body of the atom is called the nucleus. It is made up of protons and in most cases of some electrons. A proton combining with an electron

gives a neutral body. In a more complicated case the nucleus may be made up of a number of protons and some electrons, but insufficient in number to neutralize the protons. Such a nucleus will hold in the range of its attraction a number of outer electrons enough when added to the nuclear electrons to give a neutral body and this is an atom.

Man reduced the theory of matter from the mass, which could be seen and weighted to the atoms, of which only the relative weights were known. Then from them was deduced the combination of protons and electrons. Whether we are to go further than this none can tell. The ancient philosophers had three elements—the electrician has reduced the ninety odd elements of the chemists to compounds of only two constituents, a step beyond the science of old times.

But there are a few other electrons to be added to the above two.



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Murder by Atom

By JOSEPH WM. SKIDMORE

Few authors have won greater favor with their work than the author of this story which treats of chemistry and toxicology with a strong spice of adventure.

CHAPTER I

HOME FROM SPACE

DONALD MILLSTEIN, super-scientific detective, and his highly efficient assistant, Jack Cromwell, climbed from the mighty cradles which held Millstein's space fighter, the "Nemesis."

"It's too bad, Don, that the 'Falcon' escaped us. But we certainly did smash up his space ship."

The two were returning from a remarkable and dangerous excursion in the vast voids of space. There, in the mysterious realms of nothing, they had met, in deadly combat, the "Falcon"—a mad scientific genius, who had repeatedly tried to destroy the world, only to be frustrated by the daring, resourceful Millstein. On this last adventure, Millstein had destroyed the "Falcon's" space ship; but the "Falcon" had escaped in the mighty, unknown places of empty space.

"Don't worry Jack," stated Millstein in portentous tones which matched the gleam in his dark mysterious eyes. "Have the crew ready for instant duty. Fuel and provision the 'Nemesis' to capacity. We leave in two weeks to hunt the 'Falcon'."

Jack grunted with delight and turned to meet a field official, who had dashed up to the two. ☀

"Donald Millstein, you're wanted in the office. It's very urgent. The United States Secret Service is calling."

Millstein, without reply, hastily followed the official to the ornate offices of the space-ship field.

In a moment, Millstein was in a sound-proof, 'phone booth. The ever-present and inquisitive Jack was at his chief's side. The irrepressible and impulsive Cromwell listened to Millstein's voice with growing excitement.

DONALD MILLSTEIN, although world-famous scientist and super-investigator, was not of the usual, academic type. He was not aged and bearded, nor spectacled. On the contrary, he was young, virile and athletic. His fine figure and handsome face had tugged the heart-strings of many a fair maid. Not to record that Millstein was a Don Juan; his heart was entirely wedded to his scientific researches and the undoing of dangerous criminals.

Millstein's deceased father had been a powerful figure in the world of finance. The father, with a mad obsession for power and wealth, accumulated millions, and had been the target of indignant, public criticism. Scandal, regarding the sire's wealth, had reared its ugly head. There were government investigations and hideous questions about ruined stock-



The refrigeration room, forty-four, was a gruesome place. Millstein jerked back the sheets, which covered the dead bodies of Henry Simon and John Picardy.

holders. Donald, then a mere, motherless lad, learned to hate money, and to despise the unscrupulous methods of his father. Embittered, he diverted all his maturing energies to a diligent study of science. When Don was twenty-two, the canny, scheming Millstein senior had died, with a sneer for those who had tried to recover the ill-gotten millions.

Donald, as sole heir, attracted favorable, world-wide attention by immediately restoring all money to every ruined stock-holder. This laudable work required two years and young Millstein with his remaining, vast wealth, diverted all his time and energy to science, and to the highly dangerous work of netting international and powerful, organized criminals.

Jack Cromwell, a former accountant in the father's office, had worked, day and night, to assist young Millstein in the altruistic labor of restoring stockholders their money.

Thus a fine, enduring friendship and understanding was formed; the friendship of Castor and Polydeuces, the mythological warriors and adventurers, who fought always, side by side, against a common enemy.

Jack loved Don, his splendid chief. Together, the two had experienced astounding adventures. Several times, the government had called Millstein to destroy master-crooks and their terrible plots and intrigues against the society of civilization. Many times the two had thundered on flashing, speeding wings to distant countries; there to destroy, after incredible adventures, some weird espionage against men and governments.

The sworn enemy of Millstein was the Russian scientist, Verensky, who smugly and vainly named himself "The Falcon."

The story of the "Falcon" is a strange, tragic narration of the breaking down of a fine mind.

Verensky had been a wealthy, Russian physicist. Ten years before the sequence of this record, he had come to America with a great plan of new ideas for laboratories and scientific research. His discoveries of controlling the electrical energies of electrons within atoms had startled the world. The massive brain, housed in the incredibly strong body, became overtaxed and the Russian's sensitive, finely balanced reason tottered. Unfortunately, the "Falcon" became involved in a tax controversy with the United States Internal Revenue Department, that filed a heavy, income tax lien against the Russian's holdings. This developed into a legal battle which resulted in Verensky's property and laboratories being seized by the government.

A part of the Russian's brain snapped and he became a maniac—but a madman armed with a marvelous, dangerous intellect and scientific knowledge. He became obsessed with the idea that he must overthrow all existing governments. His distorted mind was determined to destroy—and to rule the world! The once kindly, generous brain became an evil, monstrous thing; all the more dangerous, because the remaining, normal brain-cells retained his vast, technical learning. Verensky was more dangerous than ten thousand drug-crazed criminals, because of his super-scientific knowledge!

The "Falcon" disappeared from the haunts of men and women; but his machinations were felt. A master at disguise and intrigue, the world never knew when, or where, he would strike!

But the world knew he would strike,

again and again, always with some new, fearful and deadly weapon, or scheme!

Several times, Millstein had foiled the "Falcon" when he menaced civilization. In each succeeding encounter, Millstein defeated the Russian's purpose; but always the "Falcon" escaped by *some desperate and insanely clever ruse*.

The fiery, hate-cankered mind of the "Falcon" had sworn by all the evil gods, that he would bring a fearful vengeance upon Millstein, because of the young scientist's thwarting of his nefarious schemes.

And Donald Millstein, lips taut and black eyes snapping with determination, pledged his God that he would bring the "Falcon" to justice.

CHAPTER II

THE EXCITATION RAY

"**W**HAT is it, Chief? What's up?" demanded Cromwell, unable to restrain his impetuosity, when he could see plainly from Millstein's face that something highly important was coming over the telephone.

"Billy Weston is waiting for us at government Secret Service headquarters," snapped Millstein; "He won't say just what for—but says it's mighty important. Get a cab and let's go!"

"It must be important," agreed the excited Cromwell. "William Weston, head of all U. S. Secret Service, was never known to waste a second on anything or anybody, unimportant" . . .

William Weston stared with shrewd, appraising eyes at Millstein. Weston's worry-lined face was tense; his gray eyes were frankly worried. His long, sensitive fingers tapped

nervously on a great teakwood desk. Millstein waited patiently to learn why he was so summarily invited to the renowned, espionage officer's private office.

Jack, at Don's side, leaned forward nervously; he knew something big was brewing. Jack enjoyed the entire confidence of Millstein; *the two were more like partners, than chief and assistant.*

"Millstein," began Weston in terse, staccato phrases, "I sent for you. My department needs you on a special job. It's dangerous—it's big—mighty big. My men are stumped. It's too vital to trust to anyone but you. It concerns the very safety and future of the United States. Will you help me?"

"Just a moment Weston!" protested Millstein. "I'm leaving in two weeks to look for the 'Falcon.' What's this all about?"

"I'm sure, Millstein, that you will postpone your plans for the 'Falcon' when you hear the details." With that, Weston looked inquiringly at Jack, and finished apologetically. "Of course I had planned that you would come here alone."

Millstein's reply came with unquestioned finality.

"Weston, Cromwell and I are the same as partners. If you trust me, you will have to trust him."

Millstein, now indeed, realized that something mighty important and unusual was involved. For Don well knew Weston was fully aware of his full confidence which Jack enjoyed.

Weston, after a moment's serious thought, went on with his explanation.

"Very well, gentlemen, you two form the most powerful combination of brains, initiative and courage in all the world, and I know you will be eager to help catch the most impor-

tant murderer in the history of the world—"

"The 'Falcon' again!" interrupted Cromwell in great excitement.

"No, not this time, but it looks like the work of someone as vicious and skilled as the 'Falcon' himself."

"You interest me, Weston, please explain," from Millstein.

"Millstein, even in this sound-proof, secret room, a thousand feet below the ground and perhaps the safest place in the world to whisper a confidence, I hesitate to give you the details. But I must, for you are the only one who can help me. You, of course, know of the glorious, scientific accomplishments of our greatest physicist, Professor Wilhelm Brenizer?"

"Yes indeed," Millstein agreed, "I've often tried to follow his incredible calculations. But only another Einstein could do that. By the way, how is the splendid, old gentleman? I heard by radio-news that he has retired after his fifty years of exhausting, scientific labors, and that he is living in seclusion."

"I wish to God that were true!" Weston suddenly blurted out, a sad look in his steady, gray eyes. "Millstein, I know this will shock and grieve you. Professor Brenizer is dead! He was tortured—murdered—a month ago! His death, for reasons you will soon know, was kept a close secret—and the world was told he had retired."

"That is awful!" burst out Millstein in suddenly aroused astonishment and sorrow. "What a sacrilege—the murder of Brenizer—the great man who devoted his life to research and study, that all the world might be benefited." Don paused, an angry determination fairly exploded in his grim eyes. "Weston, if you have sent

for me to find Brenizer's murderer, I'm your man! The 'Falcon' can wait!"

"I knew you would, my boy," said Weston triumphantly. "Some months ago, Professor Brenizer came to me. He was greatly worried, and greatly elated. His work and experimentation of fifty years was complete; for he had discovered and perfected a weapon which would end all war! He had perfected a ray—an exciting ray, that he could project on a beam of light—strange, deadly rays, which conveyed by light beams, and bathed over any area, would instantly cause an explosion of all iron atoms! The potent, exciting, vibrating ray causes the orbits of electrons in iron, carbon, manganese, nickel and zinc atoms to suddenly enlarge the circles of their flights, many millions of times. This would have the same devastating effect as a terrific explosion of T.N.T. Imagine an army invading us, and we would bathe it with light beams, carrying the deadly excitation rays! Day or night, the light beams, from a plane or at a safe distance, could be played over the approaching army, its airplanes, tanks and battleships! In an instant the countless trillions of iron, carbon, manganese, nickel and zinc atoms would enlarge and explode all component matter with fearful force! Even the soldiers would be disintegrated! For a human body contains enough iron atoms to be destroyed by the sudden enlargement of all electronic orbits, within all its iron atoms! Airplanes would fly to pieces in mid air—battleships would explode and sink! Guns, tanks and all iron and steel equipment would be blasted away!" Weston paused for breath.

"Don't you see, Millstein, this deadly ray makes war unthinkable as long as it is owned by a peaceable, altruistic nation? War would be an act of

deliberate self-destruction, if a nation, declaring war, had to battle this ray. War is practically ended, as long as the United States can hold and control this mighty secret!

“PROFESSOR BRENIZER came to us with his marvelous discovery. He was fearful that his life was in danger, and that the awful secret might be wrested from him. He had good reason to believe that foreign spies were watching his laboratory, and that some of his assistants had been polluted by foreign interests. I called in our trusted, scientific men. The President, himself, was at that great meeting. Professor Brenizer realized he was growing old, and that the sole possession of such a stupendous secret was too risky. Professor Brenizer, at that meeting, laid all his formulas and blue prints for the creation of the deadly ray on a table. These important papers, he cut into five parts and numbered them. Five of the nation's greatest and trusted scientists—all men of proven loyalty, knowledge and courage were selected. To each, Professor Brenizer gave one-fifth of the secret. These five men committed to memory each part of the formula and process. To one great scientist, whose name I dare not breathe, was given the entire formula. These five scientists—you know of them—John Picardy, Borgnan Benson, Petgard Bronsky, Milton Verick and Henry Simon, were immediately sent to the secret Government laboratory, to construct devices to project the excitation ray, and to make certain tests.” Weston paused for a few seconds and when his hard voice sounded again it vibrated with restrained anger and emotion.

“And then, Professor Brenizer sent for us to come in a rush to his fine lab-

oratory in the bleak, Vermont hills. His life had been threatened, by phone, if he did not divulge the secrets of the fearful ray. We flew to his work-shop. We found him—dead—murdered! Some foul enemy, or agent of some foreign power, had lured the kindly, old scientist into the basement of his own laboratory—at night. He had been fearfully and cruelly tortured! And my friends, the frightful condition of his body showed that he had died while being tortured. Even in his supreme agony, the benevolent, peace loving Brenizer did not divulge his all-important secret; we feel sure of this because of subsequent happenings. In desperate haste we concealed the death of Brenizer from the public, and gave out politic information that he had retired—was living in seclusion. We know from the torture-maimed body of Brenizer that some fiend-in-carnate—some foul hell-mind, vested with uncanny medical skill, directed the torture.

“And that is not all! By this time, scientists John Picardy, Borgnan Benson, Petgard Bronsky, Milton Verick and Henry Simon, were making fine progress with their ray experiments in Washington's underground laboratories.”

WESTON paused dramatically and cleared his choking voice.

“And yesterday, Henry Simon died, very suddenly. He too was murdered—for an autopsy showed he died from arsenic poisoning! We feel sure, now, that it's the same fiend who tortured and killed poor Brenizer. Millstein!” Weston's voice, in his tense excitement became a thin, nervous squeak. “One of those remaining, four scientists is a dangerous, murderous, foreign agent! Three of those remaining

scientists are doomed. We've checked every man's record—to find nothing suspicious. All of those men have a fine record of loyal, splendid lives. But the foreign powers must have reached and corrupted one of them, with a promise of vast wealth. For no outside man or agency could have poisoned Simon. The five scientists have been locked and guarded underground. They have had no contact with any one. They have food and supplies and their only connection with other humans is by phone. One of those trusted physicists is a relentless, clever murderer bent on securing the whole, awful secret of the Brenizer ray. Millstein, I'm licked; what can you do?"

Don and Jack were, by now, leaning forward with absorbed interest and amazement. Don's analytical, uncanny mind was racing; his eyes gleaming dangerously, held a glittering determination. His reply to Weston's prayer-like question shot out with startling suddenness:

"Bill, I'll catch your murderer. I'm an accredited government scientist. Send me, at once, to the secret, underground laboratories to take Simon's place. I'll carry out his work and I'll find out which one is the killer. I tell you, Weston, some mighty, foreign agency is behind these two murders. We must act quickly. I have the feeling the killer will strike again and quickly. "No! Jack," this to Cromwell, as Don noted the pleading appeal in his assistant's face, "only I can go to take Simon's place. You must stay and help on the outside."

"Just a moment," interrupted Weston, reaching for a telephone. "It's my emergency signal, to be used only when something very unusual and important has happened. Hello—yes—yes—God!"

In a moment Weston hung up the phone. There was a tragic something in the Secret Service chief's face—something mighty. He looked sadly—but hopefully, appealingly at Millstein and Cromwell.

"Millstein, now both you and Jack will go into the underground laboratories! And for God's sake, let's arrange it at once! John Picardy, one of the remaining scientists, has just died—murdered by poison—arsenic!"

CHAPTER III

THE LABORATORY OF MURDER

DONALD MILLSTEIN and Jack Cromwell stepped hastily into the great elevator, which was being held to convey them to the underground, government laboratories. Barely an hour had passed since they had left the hidden offices of Weston.

With miraculous speed, the usual official red tape had been set aside by the efficient Weston; and Jack and Don were now on their hurried way to replace the two, murdered scientists; and Millstein was vested with formal, government authority to take full charge of the situation in the underground laboratory.

The elevator dropped with startling speed; so fast that Don and Jack grasped the provided hand rails, in order to balance their almost weightless bodies.

"Don, this killing business looks like the 'Falcon's' work to me," stated Cromwell. "If he knows, in some way, about the excitation ray, of course he will do his worst to get control of the secret. What do you think about it?"

"That's just it," replied Millstein, "I have been thinking about it. But

how can one of those three remaining scientists be the 'Falcon'? We know he has been out in space, fighting with us for the last three months. This looks like a tough assignment, Jack."

The shrill scream of air, braking down the elevator's speed, cut off their conversation, and in a moment they stepped from the steel door of the cage.

They were met by a dozen, heavily armed soldiers under the command of a young, West Point Lieutenant. That pigeon-breasted, snappy, young officer addressed himself to Millstein and Cromwell.

"Mister Millstein, I've been detailed to take you to the Experimentation Laboratory. It's a great honor, sir, to act as your escort. Tenshun! Squad, forward!"

Both Don and Jack were impressed with their reception by the well-trained soldiers. It was apparent that Bill Weston and his government men were taking no risk for their personal safety.

Even the adventure-and-danger-hardened adventurers were amazed by the infinitely painstaking care which was used to admit them to the secret laboratory. Many, great, serrated, steel doors were opened and shut by trusted officers, before the two operatives reached the laboratory. These vast precautions, in spite of the fact that all guards and officials of the underground government warehouses and laboratories had been notified of Millstein's mission and haste.

"We're important guests," chuckled Jack. "If the murderer has as tough a time getting out, as we have getting in, our job will be easier."

"Don't worry Jack. No person ever enters or leaves these tunnels without government permission and on an order signed by Weston, who is head

of the Secret Service and in these troubled times almost as big in power as our President."

"Here's the last door, Mister Millstein," barked the young officer. "Please wait until I phone headquarters for a last check-up on my orders. No one is ever permitted through this door, without this final formality."

In a moment the officer gave instructions to the three guardsmen. "H.Q. says O.K. and hurry."

But it required several minutes for the guards to operate the intricate combination and mechanism. The mighty, armor-steel door moved open ponderously, and Don and Jack stepped inside as the great door started to close. They were in the great, underground government laboratory at last! Locked, five thousand feet under ground, with three scientists; of whom, two were fine patriots, and one a clever, relentless murderer!

Millstein gazed about the great, domed room in almost reverent awe. Few civilians had ever had the honor and privilege of visiting the nation's important, secret testing rooms for all unusual and dangerous, scientific discoveries.

"Cosmos! Jack," Millstein gasped, "did you ever see such a finely equipped lab? Here, let's see the blue print of this plant that Weston gave us. There—that big room is the main lab, and here, the second door to the right, is the administration office. I'll go in there, Jack, and you go through the rooms and ask scientists Bronsky, Verick and Benson to report to me at once. Explain, if they don't know it already, that Weston has sent me with full authority to take charge. Be polite, Jack, but get them to me at once. And find out where the bodies of Simon and Picardy are located. Step lively!"

"Righto, Chief," snapped Jack, as he leaped away, grinning. For Millstein was suddenly his old usual, relentless, swift-thinking self—a cold, analytical, scientific man-hunter. . . .

DON MILLSTEIN sat at a fine, mahogany desk, as he waited for Jack to summon the three scientists to the administration office. Millstein realized, full well, that he was facing the most difficult task of his man-hunting career. Some mighty and unscrupulous nation was behind this desperate scheme to obtain the secret of the Brenizer Ray!

The thoughts of the young scientist raced in retrospection. Somehow the "Falcon" seemed to be ever-present in his mind.

The "Falcon"! Super-criminal of the solar system! But Millstein knew that if the "Falcon" was aware of and trying to secure the Brenizer Ray secret—that the master criminal mind was not acting for any ambitious nation! No! The "Falcon," if after the deadly secret, would want to use the terrible ray to conquer the world—for his own insane, distorted purposes!

Millstein knew he must proceed with infinite caution. He realized that his life had been in constant danger, since he had left Weston's offices. One thing he knew certainly, if it was the "Falcon," then action and danger would come quickly! And the murderer had already acted with horrible speed!

Millstein recalled his past encounters with the "Falcon"—a series of desperate, scientific battles in which so far, the brave, young physicist had succeeded in thwarting the "Falcon's" schemes against all society.

Don recalled his first encounter with the "Falcon"—in 1960, when the

"Falcon" caused a world-wide, monetary panic by a strange device which destroyed about half the world's gold supply, before young Millstein destroyed the apparatus.

Millstein, after terrific adventures, succeeded in locating the devices and destroying all of them! thus saving the world from financial ruin and riot. In this adventure, Millstein was severely wounded by the infuriated "Falcon." The mad Russian was a most skilled swordsman, and it was his morbid delight to force a captured enemy to fight with him at swords. It was said that over a hundred, fighting men had died before his deadly, flashing blade. This was but one weird twist of the "Falcon's" distorted, cruel brain; a brilliant scientist, yet he reverted to ancient type and customs when dealing with a personal enemy.

Millstein had escaped after his wound and there followed a rapid sequence of exciting encounters, in which Millstein invariably outwitted the obsessed Russian.

Only recently, Millstein had destroyed a mighty space ship of the "Falcon's"; a vast, space ship with which the insane Russian was trying to destroy the world.

Once more, Millstein had defeated the Russian's purpose, and with his speedy space-ship, the "Nemesis," had destroyed the "Falcon's" mighty space-fighter.

All the civilized world worshipped Millstein for his great and daring exploits, and all the world knew of the sworn feud to the death between Millstein and the "Falcon."

Millstein relaxed in the easy chair and stared with unseeing eyes at the desk. He was thinking: "No!" he suddenly decided in his mind, "this is not the 'Falcon's' work. He has been too

busy of late. Still, he is far-reaching in his resources and possibly he has—"

"Here they are, Chief." Jack entered and interrupted Millstein's thoughts as he escorted three heavily built men, clad in white aprons and coats: "Gentlemen, this is Donald Millstein—you've heard of him—Donald—I—I mean Mister Millstein, this is Professor Bronsky—Professor Verick—Professor Benson."

Millstein did not leave his chair; but gestured the three waiting scientists to be seated in three chairs he had previously arranged in front of the desk.

For a period of several minutes, Millstein gazed intently at the three. His boring and searching scrutiny seemed to lay bare the soul of each. The silence became stifling, unbearable.

Finally, after what seemed eons, Millstein rose slowly to his tall, sinewy height. His eyes flashed as his voice rang out dramatically.

"Gentlemen, there are only five of us. We are locked in this great, underground laboratory. One of us five is a foul murderer!"

CHAPTER IV

DRAMATIS PERSONAE

MILLSTEIN'S voice thundered on with inspired zeal and magnetic force: "And not one of us will leave this laboratory until the murderer is caught! One of you three has murdered scientists Henry Simon and John Picardy—and by arsenical poisoning! An old method, but in this case, the poison must have been given by some diabolically clever means—to justify such a clumsy and age-old method of killing. I have full

government authority to take charge. Here is the documentary evidence. Each of you will proceed with your experiments on the Brenizer Ray as if nothing had happened, Jack Cromwell and I will take the places and work of poor Simon and Picardy. I will find the killer! I am sole law, here. No one is to eat or drink anything, until I have tested it for poison!

"And now, gentlemen, two of you are noble, altruistic scientists trying in every way to do something fine and beneficial for mankind. You two are even gladly risking your lives here. To you two, who know in your own hearts which two you are, I ask your cooperation in every way. I will now interview you all, but one at a time. Scientists Verick and Bronsky, will you kindly retire with Cromwell and remain available? And scientist Benson, will you kindly remain seated?

"Benson," shot out Millstein when the two were alone, "I'm proceeding on the theory that a man is innocent, until proven guilty. I'm not going to adopt police examination methods. But it's my job to trap a murderer. If you're innocent, you will try to help me. I know the full life history of each of you. That information was given me by Secret Service before I came here. Now, Benson, tell me anything and everything which may be a possible clue for me."

Benson's reply came with frank and convincing directness, as he nervously lighted a small cigar.

"Millstein, I am innocent. I don't know who killed Simon and Picardy. I'll help you all I can; but I can think of nothing that would be a clue. My past record and service to my country should clear me of all suspicion. As you know I am a graduate medicine doctor. It was I, who determined by chemical analysis that Simon and Pi-

cardy were killed by arsenical poisoning. They were murdered, for neither one had any thought of self-destruction. Any one of us may go next. I hope to God you catch the murderer at once!"

"Benson!" snapped Millstein, "two years ago, you visited abroad. The department has no record of the details of that trip. It's the only possible suspicious event in your personal history. Can you explain that trip and account for your foreign contacts?"

"Indeed yes!" burst out Benson. "I'm Swedish. I made that trip to visit my relations. I can prove it and I can account for every moment. Shall I—?"

"Not at this time, Benson, thank you. Later perhaps, if it seems important. You're a heavy man—and stout. What do you weigh?"

"Two hundred and twenty," answered Benson, his big blond face, grinning as his huge chest unconsciously swelled, "I'm pretty strong!"

"So I see," muttered Millstein. "Here!" with that Don snapped a match toward Benson, as he noted the scientist was feeling in his pocket for a match to light his cold cigar. It was a clever trick of Millstein's to test the mental and physical reactions of the suspect. The result was startling! As the light match whizzed through the air, the great, right hand of Benson snapped upward like the whipping stroke of a cobra! Two thick, but agile fingers plucked the small bit of wood from the air as if by magic!

"You're mighty quick and sure of eye, too, Benson. That is all and thank you. Kindly ask Verick to come in."

Without a word, Benson rose with cat-like agility and left the room.

Millstein made certain pencil notations in a small book as he muttered, "Benson, shrewd, honest attitude, am-

bidextrous with trained eyes and muscles, physical type—"

Millstein ceased his making of notes, as Professor Verick slowly entered the room and seated himself.

Verick, Millstein noted with hard, appraising eyes, was taller than the other two scientists; but even with his towering height, he possessed a mighty torso. His thick neck was corded as that of a champion wrestler. As a strange contradiction, his lined face was thin and moulded as if carved from granite with rough strokes. Black, unfathomable eyes, topped with a vast mop of snow-white hair, made Verick a striking figure of a man. Millstein realized that this man was no ordinary type.

"Professor Verick!" shot Don with startling suddenness, "Did you kill Simon and Picardy?"

Without the slightest change of expression, or any emotion, Verick replied in a deep, calm voice.

"Certainly not, my dear Millstein!"

Millstein took a cigarette from his case. "Cigarette?" he asked, snapping one toward Verick.

But Verick made no snatch for the roll of tobacco. His hands or eyes did not move in the slightest degree as the cigarette sailed past him!

"No, thanks, Millstein. I only smoke cigars." With that, Verick took a cigar from an inside pocket and lighted it. "Go ahead and question me. I suppose you've looked up my past. Believe me, I want to help catch this murderer. I'm more than anxious, for perhaps I'll be the next to be killed!"

Millstein realized that he had an unusually intelligent and resourceful mind to analyze. Here was shrewdness, self-control, and determination of purpose, personified. Any average man would have instinctively grabbed for that cigarette!

"Verick, a year ago, you suddenly disappeared from your private laboratory under somewhat suspicious circumstances. It was quite a sensation, when you, one of our greatest scientists, disappeared without any word of explanation. Even your wife and family did not know why or where you went. Where did you go?"

"Well, well," laughed Verick, "such a mountain out of a mole-hill! I was overworked and threatened with nervous breakdown. I had completed an involved study of the ninety-ninth element and was exhausted mentally. I simply gathered my fishing tackle together and hit out for the mountains. I purposely left no address or notice of my intentions, for I wanted to insure myself of solitude and rest. I wrote my wife from the last mountain village; but I have since learned that she never received my letter."

"Have you seen your wife since your return from the mountains?" Millstein's tones were hard.

"Well, no, I haven't," hastened Verick, glancing sharply at Don. "You see, as soon as I returned to civilization, I found that William Weston was looking for me. I went direct to him and he sent me post-haste here to work on this all-important Brenizer Ray."

"By the way, Verick, how are you progressing with your ray experiments?"

"Fine!" burst from Verick with scientific ardor. "I believe I'm on the verge of a great discovery which will increase the effective area of the ray. I hope you will come to my workshop soon, and help check my calculations. I'm in shop number forty-two."

Don stared at Verick for a long time; but the scientist's mask-like face gave no hint of his thoughts.

"Thanks, Verick. That is all for now. Yes, certainly, I'll drop in and

check your calculations. Kindly ask Bronsky to step in."

Millstein started to make notations after Verick's name; but on second thought placed the note book in his pocket.

Suddenly, a veritable tornado of excited fury burst into the room!

Petgard Bronsky, large, florid and epileptic with indignation, dashed up to Millstein's desk. His twitching lips pulled in anger.

"This is a damnable outrage, Millstein! You've no right to accuse me, Petgard Bronsky, of murder, I who have worked ten years for the United States. I, who discovered the—"

"Just a moment!" cut in Millstein, curtly. "And just who has accused you of murder? Control yourself! If you are innocent, the best way to prove it is to help me."

With a mighty mental effort, Bronsky pulled himself together. His next words were more calm.

"Pardon me, Millstein. I'm not a murderer—I'm a scientist. But I'm afraid the killer will get me next. I tell you, he is after the secret of the Brenizer Ray. I'm afraid!" There was stark terror in the big man's voice and consuming fear in his codfish-like eyes.

"Here, take a cigarette and get hold of yourself," soothed Don as he snapped a cigarette toward the other.

Bronsky's large right hand instinctively cuffed at the flying cigarette, but only struck it awkwardly to the heavy carpet. With his huge, moon-like face contorting nervously, he reached down, retrieved the cigarette and thrust it hastily between twitching lips.

Soliciously, Millstein leaned forward and held a light for the almost hysterical scientist. It was now, that the keen, observing eyes of Don made

a most astounding discovery. Bronsky's hands were quite steady; they did not tremble in the least! Bronsky was either a chronic neurotic, whose hands were strangely unaffected, or he was a most consummate actor!

"Now Bronsky," snapped Don, "I know your fine record of scientific achievements and your splendid service to our country. But one of you three is guilty. Help me find that man! There is one element in your past which requires explanation. You are a Russian. You became a renowned scientist in that country. Ten years ago, you left Russia and became a good, American citizen. Why did you leave your native country where you had attained fame?"

"I was driven out of the cursed country," snarled Bronsky with ill-concealed bitterness; "I offended the cruel, vicious powers that were in control. My properties were seized. I was given two days to leave the country. I came to America—the land of hope and freedom. I have served my new country faithfully. I hate all foreign powers. I—"

"That's enough, for this time, Bronsky. How are you progressing with your experiments on the Brenizer Ray?"

"Not so good," grunted the Russian, "these murders have upset my mind. I cannot work."

"I'll call at your work-room later and help you, if I can," stated Don. "That will be all for now, and thank you. Will you ask Jack Cromwell to step in as you leave?"

Bronsky left with frantic haste. Don stared after the large figure of the departing scientist, with a perplexed gaze.

"Well, Chief, how goes it? Did you find out anything about these birds?"

"Not a great deal, Jack. We're up against a clever killer. You and I must be with the three scientists every moment we can. The murderer will act soon, I'm sure."

Jack started to flop into the chair, recently occupied by the three suspects; he stopped and bent over, reaching down.

"Here Don, one of your visitors dropped his pocket-lighter under the chair. It's a beauty."

One of his sudden, mysterious, warning impulses flashed into Millstein's brain. Some instinctive intuition of danger!

"Wait Jack, don't touch it!" Millstein leaped around the table, moved the chair, and on hands and knees, inspected the expensive looking lighter, without touching it.

"Looking for fingerprints?"

"I don't know, Jack, I just got a sudden hunch to be careful with this lighter. Hand me those pliers."

Holding the lighter with the pliers, Don took it to the desk. Working quickly, he dusted the silver surface with powder and blew on it gently.

"No finger prints Jack. I guess my hunch was wrong." Then his voice rang out as he unscrewed the small plug in the bottom. "No, I'm not wrong. Look! there's no alcohol in the thing. I have a strange feeling that it's some deadly device. For instance, it's such a natural thing, for either you or me, to pick it up and roll the flint wheel with a snap of the thumb! But there can't be enough explosive in it to make a destructive bomb. Look out! Stand clear!"

Holding the lighter at arms length with the pliers, Millstein took a cigar from the desk. He placed the cigar as a human thumb would press on the ignitor wheel and gave it a smart roll.

There was a clicking snap, and instantly two, curved, fang-like needles were imbedded deeply in the cigar!

It spoke well for the steel nerves of Millstein and Cromwell that they did not start. Millstein looked at Jack with serious eyes.

"Jack, the killer has made his first try for one of us. Look! those steel needles are hollow and of course full of some deadly, instantly-killing poison! We have to move cautiously. Say nothing of this!"

"O. K. Chief—that was a narrow squeak. If you had let me pick it up, I would have been sure to spin the wheel—to see if the damn thing worked!"

CHAPTER V

A DEAD RAT

"TAKE no chances, Jack. Don't eat or drink anything until you've tested it for poison. Watch small things! Let the simple but deadly cigarette lighter be a lesson to both of us. The next try to kill us will be by some everyday gadget—wait! I've an idea! Here, give me that lighter!"

With swift, sure fingers, aided by the pliers, Don again actuated the deadly device. Snap, and once more, the curved, steel fangs were instantly sunk deeply into the cigar. Then, with the pliers, he gingerly twisted each steel prong from its ingenious fastening.

A quick test showed that the poison teeth of the device were drawn! It was now harmless. Don carefully placed the steel needles in an envelope for future analysis.

"Later, we'll find out what kind of poison is in those needles. Come on, Jack, let's go! What rooms are the scientists in?"

"Benson is in shop forty, Bronsky in forty-one, Verick in forty-two. What are you going to do, Chief?"

"We're going to study the reactionary emotions of the three suspects when I hand them the lighter," snapped Don, as they strode along the great hallway. "Here's room forty. Watch their eyes and hands closely. The guilty man may show some emotion when I hand him the lighter."

Without knocking, Millstein opened the door of room 40, and strode in, with Jack close at his side.

"Oh, hello, Benson. We dropped in to see how you're progressing." With that terse statement, Don moved close to the white-aproned scientist, who was peering intently through a microscope.

With a nervous start, Benson moved back from the finely equipped bench and turned toward Millstein.

As the big, cat-like Benson wheeled with surprising agility, Don tossed the cigarette lighter toward him.

"That's yours, Benson, you dropped it on the carpet in my office."

With marvelous speed and accuracy, Benson snatched the lighter out of the air and held it in his hand for a quick appraisal.

"It's not mine, Mister Millstein. I never saw it before." There was not the slightest change of expression on the scientist's face as he hastily handed the lighter back to Don.

Millstein's voice betrayed no disappointment as he took the lighter from Benson's hand and placed it carelessly in his coat pocket.

"Benson, I came in to tell you of a safety precaution I'm taking. It's an emergency order and it's in effect from now on. None of you three scientists are to leave your work-rooms! You can see that this will prevent the murderer getting at you two

innocent men! Jack, or I, will bring your food and it will be tested for poison first. Keep your doors locked from the inside, and admit no one but Jack, or me! This will give me all my time to trace the killer, for I won't have to guard the lives of you three. Continue with your study of the Brenizer Ray, and I'll want to check your work later. Thanks for your co-operation. I really hope, Benson, I prove you innocent!"

"You will," rumbled Benson in a deep voice. "I'll work with you, and I think your idea of isolating the three of us is most splendid."

"And you're a graduate medicine doctor, Benson. I may ask you to assist me later—to examine the bodies of Simon and Picardy." With that, Don motioned to Jack and the two left the workshop.

"We didn't get much from Benson," ventured Jack; "I watched his eyes like a hawk. And did you see that chap grab that lighter? I'll bet he could pick a mosquito out of the air!"

With a sudden push, Millstein opened the door of workshop 41.

Petgard Bronsky was seated in the fine laboratory at a large desk. He was figuring with profound intensity at some highly intricate calculations. Papers, instruments and equipment were strewn over the desk in chaotic confusion. The huge scientist sprang to his feet when he heard the approach of Don and Jack. His large face twitched nervously; evidently he was greatly startled.

"Gad!" he mouthed. "You gave me a start! I was trying to concentrate."

With a few, terse words, Millstein advised Bronsky of the emergency safety order; that each of the three scientists were to be isolated in their workshops to prevent further tragedies.

While Don was speaking, Bronsky was apparently making a great effort to control his nerves. Finally, as Millstein concluded, he chattered:

"A good idea, Millstein, a splendid idea."

"Is this yours?" Millstein suddenly demanded, thrusting the cigarette lighter into Bronsky's hand. "You dropped it in my office!"

Bronsky looked at the innocent appearing lighter and handed it back to Don, with fumbling hands.

"No! It's not mine!"

Millstein and Jack withdrew from the room, leaving Bronsky pawing among his scattered papers and instruments. In a few seconds they stood before workshop 42.

"This Milton Verick is a deep one. I can't figure him out. Watch him close. Somehow, I have my suspicions of him!"

"Okay, Chief, let's go," returned the eager, interested Cromwell.

As they entered, Verick barely glanced up from an intricate apparatus he was adjusting. Don and Jack watched, with professional interest, as Verick made quick and complicated experiments. The apparatus consisted of a powerful dynamo, with huge condensing coils and glass tubes, in which were neon-gas-like, colored, writhing flames. Across the top extremities danced and sputtered static, electrical energies. All these devices were wired to a small, cigarbox-size replica of the larger apparatus.

"Ah! Gentlemen, you honor me with your visit," Verick sang out, as he looked up from his experiments. "Here, Gentlemen, is a device I've built to test the Brenizer Ray! Of course, I've weakened the force of the ray by a trillion times, so it's safe to handle. But even at that I have

just killed a rat with the ray—and at a ten foot distance! Too bad, that I've burned out a fuse-coil, or I would demonstrate it for you."

While Verick was speaking, he was indicating the small device and a large, white rat which lay dead on the bench!

"You're making splendid progress, Verick," complimented Don. "Oh! yes, is this yours? Did you not drop it in my office?" Millstein quickly thrust the cigarette lighter into Verick's hand, while speaking.

"No, it's not mine!" stated Verick, apparently unconcerned and uninterested. "Here let me show you an experiment I'm planning."

As Verick urged Millstein to follow, he was tossing the lighter from one hand to another—as one will absent-mindedly juggle a ball.

Millstein was disappointed with the outcome of his lighter test. No one of the three scientists had shown any perturbation or dismay—or any feeling—at sight of the lighter. Yet one of the three had left it to kill him!

And Don realized that, if it had not been for his inspirational, mysterious warning, he, or Jack, would have been killed by the infernal, little device. By this time one of them would have been dead as a rat!

"Rat!" Don thought with a mental explosion. "That rat, if killed by the Brenizer Ray, would be blown to pieces, mangled!" Don's brain raced. He managed to surreptitiously nudge Jack in a peculiar way. Jack fell back, for he knew by the signal Don wanted to give him a message.

With his hands clasped loosely behind him, Don moved along with the voluble Verick, who was explaining, in technical terms, another device.

"Wait Verick," broke in Don, "I must tell you of the emergency order I've issued to you three. You all are to be isolated and—"

As Don explained the order in detail, his agile fingers, concealed from Verick's eyes, were coding to the alert Jack a strange message!

Even the danger-calloused Jack nearly started in surprise as he spelled out the startling message from Don's fingers. Jack, at once, began to stroll nonchalantly toward the miniature Brenizer Ray machine. For the message was: "Get that dead rat in your pocket!"

Just as Millstein finished explaining his emergency order, he heard Jack clear his throat twice! Don then knew Jack had the rat!

The three moved toward the door. "Your order will be obeyed, Millstein. I think it's a wise thing to isolate us."

Then Don and Jack noticed a most important and startling thing! While Verick was speaking he was whirling the lighter ignitor wheel with a huge, strong thumb!

"Oh! yes, Millstein. Here's this lighter! It won't work anyway!" As he spoke, Verick gave the ignitor wheel one last buzzing whirl and handed it to Millstein.

With no more words, Don and Jack returned to the administration office.

Don flopped into the easy desk chair; he was thinking deeply.

"I guess, Chief, the lighter test lets Verick out as a suspect? He surely wouldn't have spun that ignitor if he planted it here to get you!"

"I'm not so sure, Jack. It's got me thinking. Did you bring that dead rat?"

"Sure did, Chief. Don't I always bring home the bacon?"

CHAPTER VI

DEATH STALKS

SOMEWHAT gingerly, Jack took the white rat from his coat pocket and placed it on the big table. The white rodent, of the genus *Mus*, was of the kind extensively used for laboratory experiments.

"What's the big idea, Don?"

"I have a hunch that Verick was lying when he told us he had killed this rat with the Brenizer Ray. That ray, if used to kill, would have literally exploded the rat's body. We will take the carcass to one of the laboratory rooms and make some tests. Where is the blue print of this plant? I want to look it over again."

"I put it back in your brief-case, Chief."

"Jack," began Millstein in serious tones, "I must warn you again to guard against death traps. We're dealing with a vicious and infinitely shrewd mind. We must be on our toes every second. It will be some everyday and commonplace device which will be used to try and kill us. Study every move you make."

"That's right, Chief. One of those scientists could have entered this room while we were questioning the others; and could have planted some infernal machine! But of course, the door was locked."

"That lock, although a splendid one, would not stop a killer, clever as ours," Don frowned in deep thought and continued, "Jack, I must confess that the chance you mention, of some one entering in our absence, had escaped me. I guess I'll have to watch my own step. Look around the room to see if everything is right while I go over the blue print."

Millstein reached and grasped the handle of his bulky brief-case which

lay on the table before him. His long, sinewy fingers clasped the handle.

Suddenly he stiffened with eyes staring toward the brief-case! One of his unexplainable warnings had flashed into his consciousness; a mysterious, occult instinct which had saved his life many times.

"Jack!" He hissed. "Have you touched this brief-case? Did you move it?"

"No. What's wrong?" Jack came close, anxiously. "I put the blue-prints in it when we first came in. But you have had the case open several times since."

"When we left the room, I'm sure I placed the case on that end of the table. I tell you, it's been moved! Careful, don't touch it!"

For a few moments, Millstein walked around the fine leather case, studying it from all angles. Cromwell watched with excited interest.

With painstaking caution, Millstein finally lifted one side of the case with a long ruler; while holding it slightly lifted, he placed a small mirror, so that it would reflect the desk-top area under the case.

"Jack!" shot out Millstein. "A small screw-eye has been twisted into the desk top! There's a stout cord tied to it and the cord leads into the brief-case through a punched hole in the leather! It's an infernal machine! Cosmos! If I had moved that case toward me or picked it up we would have been blown to bits! Here! hand me those scissors! I'm going to cut the cord!"

With taut lips, steady, cautious hands and sure eyes, Millstein cut the cord, and carefully opened the brief-case. Inside, among his papers, was a small, flat box from which protruded the severed cord!

Millstein, during the course of his

man-hunting career, had studied the mechanisms of bombs and infernal machines; and the young scientist was a super-mechanic. He knew it was highly hazardous business to tamper with the device, or to take it apart. Yet he decided to take the risk! He felt sure that the cord was planned to actuate some trigger device inside the box; no doubt, a fulminating cap under a cocked hammer. Perhaps the ingenuous murderer had constructed the device so that taking it apart would cause it to explode!

Millstein, however great the risk, was determined to study the mechanism of the machine. He spoke tersely:

"Go over in the farthest corner of the room, Jack. No use for both of us to get hurt! This thing might go off!"

"Be careful, Chief!" Jack's voice was a prayer.

Millstein gave a sigh of relief as the cover of the box came away without mishap.

"Look here! Jack," Don said. "It's a clever, little engine of destruction! See that spring and cocked hammer! When the cord is pulled gently the released hammer will strike the detonator and that sixteen ounce bottle of nitro-glycerin would do its work. There! I'll fix that, to make it safe, right now!"

In a heart-stopping second, Millstein carefully removed the firing mechanism from the bomb. "Here, Jack, put this cursed bottle of nitro-glycerin in that closet. Be careful with it! Be careful about everything you do! Do not even move from place to place, without thinking! Don't pick up or move any object! This room is filled with death traps!"

Millstein stood thinking. Finally

he sat down on the carpet in the middle of the large room!

"Here's a safe place. Sit here and let's talk this over. Things are getting serious. That was a narrow escape!"

Cromwell sat down at Millstein's side. The young assistant did not speak; he well knew the moods of his Chief. He knew Millstein was now thoroughly aroused, and that he was searching his keen mind for a clue to find the murderer. For a half-hour, Don sat, with eyes closed, thinking. Jack knew that some startling decision would result from Millstein's mental concentration.

"Jack!" came with Don's sudden spring to foot. "Come on! We will get hasps and padlocks from the supply room and tools. We're going to lock each scientist in his workshop and from the outside! And bring the dead rat! We're going to a laboratory room and will dissect our rodent friend. Let's go!"

As they stepped into the hall and carefully closed and locked the door, Don looked up and down the hallway.

He took a postage stamp, wet its adhesive side, and, reaching high, stuck the stamp tightly over the crack of the door. No one could see the stamp without a searching scrutiny.

Jack's face was a question mark.

"When we return, Jack, we will know whether we've had an uninvited guest. If any one opens this door, the slightest, the stamp will be torn!"

Cromwell fairly beamed in his pride and admiration of Millstein, "You're good, Chief."

It required but a few minutes for Cromwell to attach hasps and locks, while Millstein explained his pre-

cautionary move to the three scientists. But he said nothing of the two infernal machines. The three scientists appeared to welcome the news that they were to be locked in.

Bronsky, nervous and excited, was vehement in his expressions of relief. "Now I can work in peace."

IN workshop 44, Don and Jack found a marvelously equipped laboratory, dissecting tools and testing chemicals. After locking the one door, Don placed the rat on a table, and with a lancet cut into the thigh muscles of the rodent.

"Just what I hoped for, Jack. See! the flesh is solid, not shattered from electronic explosions of iron atoms such as the Brenizer Ray would cause. No! this rat was not killed by the ray. Let's see what killed it!"

With a long cut of his lancet, Don opened up the animal's viscera, and in a few seconds slit open the stomach and intestines.

"Cosmos! I believe my hunch is right! Notice the lining of stomach and intestines. They are congested and inflamed! Wait a second! Hand me that large bottle of acid marked X.A.2!"

With a hasty chemical test of a small portion of the rat's stomach and a searching scrutiny with a powerful microscope, Millstein sang out: "The rat died from poison! Arsenic! And that points the finger of suspicion at scientist Verick!"

CHAPTER VII

ARSENIC

"ARSENIC," went on Millstein academically, "killed scientists Simon and Picardy, and now we find a rat, in Verick's workshop, which has also been pois-

oned by arsenic." Don's eyes seemed to be projected into space as his trained mind analyzed the problem. Jack said no word to break Millstein's concentration. Years of danger, spent with the young scientist, had taught Jack never to interrupt the studious moods of his chief.

"Arsenic is element number thirty-three in the atomic scale and is number seventy-four and ninety-six hundredths in atomic weight; which means that every atom of arsenic has in its nucleus seventy-four positive electrons, and also in each atom thirty-three negative electrons."

While speaking, Millstein was giving the same chemical and microscopic test to a piece of flesh from the dead rat's thigh. For once, the steel-nerved Millstein started in surprise! Jack leaned forward.

"Cromwell, here is a riddle! The flesh of the rat is also saturated with arsenic! Our rat died of arsenic, but not from eating it! What a problem!" Again Millstein's voice seemed to reflect his thoughts:

"Arsenic is a specific irritant poison. Almost all the compounds of this metal are poisonous. The term 'arsenic' is, however, most commonly applied, not to the metal itself, but to its lower oxide, arsenious oxide, which is also known as white arsenic. It invariably affects specifically the stomach and intestines, causing congestion or inflammation.

"The symptoms of acute arsenical poisoning do not come on, as in the case of corrosive poisoning, immediately after the poison is swallowed. There is usually an interval of half an hour or so before prominent symptoms supervene. Generally, after a feeling of faintness and depression, an intense burning pain is felt in the region of the stomach with tender-

ness on pressure. Nausea and vomiting generally follow. Vomiting is followed by purging, blood being frequently distinguishable in the evacuations. There is thirst, a feeble irregular pulse, and a perspiring clammy skin. The victim usually succumbs within eighteen to seventy-two hours; if he survives the latter period, good hopes may be entertained of his recovery."

With a mental jerk, Millstein stopped his technical discourse and muttered an apology.

"Pardon me, Jack, I was thinking out loud."

Cromwell only grinned. Don glanced at his watch.

"Cosmos! We have to get some food to the three scientists. Where is the commissary?"

"**T**HOSE three scientists seem to be fine chaps. It's hard to think that one of them is a murderer and a foreign spy!"

Jack's voice was sincere as he watched Don carefully inspect the postage stamp fastened on the door of the administration room.

"The stamp has not been disturbed, Jack. No one has been through this door while we were away. Come on in."

It was very evident that Millstein's caution and suspicions were thoroughly aroused, for, upon entering the room, he glanced shrewdly around with searching eyes.

"Lock the door, Jack. Just to be sure, we'll move that heavy desk up against it. We've got to get some sleep. It was quite a chore taking dinner to the three scientists and getting our own meal. Wait! old chap, let's look this desk over before we move it! I'm still shaky from that devilish bomb in my brief case! Look

under the legs—no wires or cords?—all right—let's slide it up against the door. Hold it! Plug the keyhole first, so no one can squirt poison gas in on us! Cosmos! I'm tired."

"Chief, you take the couch over there in the corner. I'll bunk on the floor."

"Jack, we will both use the couch, but one at a time. We're in great peril, even if we are locked in. Our enemy is resourceful and dangerously cunning. Each of us will sleep four hours, while the other keeps careful watch. You turn in first."

"I will not, Don. You sleep first." There was such finality and devotion in Jack's voice that Millstein smiled:

"All right."

Millstein stepped over to the fine leather couch and removed his coat and vest. The couch was covered by a large, attractive, Indian blanket.

Don started to sit down on the couch to remove his tie and shoes and suddenly frowned. Once again his mysterious, instinctive warning boomed in his brain!

"Come here, Jack," he called. "Let's inspect this couch. It might be a death trap of some kind. Bring that heavy chair. I'll pound over the couch a bit before I lay down. It seems all okay. Wait! Pull that blanket off and lay it on the floor!"

Freeing the fastened ends of the blanket, Jack spread it on the floor. Both men turned to inspect the leather couch. They stared in excited surprise!

Lying flat on the smooth, brown leather were two most amazing and frightful gadgets of death!

Don and Jack bent over to study the two deadly devices, two small, flat, rubber sacks, each one shaped like a small saucer. But out of the

top and center of each disc, protruded an inch-long, sharp needle.

With the stout desk-ruler, Don pressed hard on one rubber sack. Instantly green, vicious-looking liquid appeared at the needle point!

"What a clever death trap, Jack! You see, if I had sat or lain on the couch, my weight would have forced the needle into my flesh, and also forced the poison into my bloodstream. It's a sort of self-acting hypodermic! I'll bet there's enough poison in those rubber discs to kill a dozen men!"

For a few moments, Millstein restlessly paced the floor. All thought of sleep was gone from his mind.

"Cromwell, that was a close call! I have come to the conclusion in the last ten minutes that we are dealing with the 'Falcon'! These clever death traps resemble his work. But surely, none of the three scientists can be the 'Falcon', and there are only five humans in these laboratories. Unless, Jack the 'Falcon' has succeeded in getting past all the doors and guards—and is hiding! No! that is almost impossible! Yet this must be the 'Falcon'; he is insanely clever and daring!"

Millstein paused to think. His dark eyes closed. He spoke:

"Jack, we've got to work fast. We're going back to laboratory forty-four. Arsenic keeps popping up in my mind, and the amazing fact that the rat's flesh is saturated with pure arsenic—that, Jack, is our clue! How did the arsenic get in the rat's flesh? Why did it not die from the arsenic in its alimentary system alone? Where are the bodies of Simon and Picardy?"

"In the refrigeration room, Chief. It is next door to room forty-four."

"Come on, Jack. Shove the desk aside."

In a few seconds, they had unlocked the door and in the hall, Millstein paused to fasten another postage stamp over the door crack. They stepped rapidly down the long hallway.

THE refrigeration room was a gruesome place. Millstein jerked back the sheets, which covered the dead bodies of Henry Simon and John Picardy. It was bitterly cold and awesome. But the two young adventurers were not the least perturbed by the sight of death, even in its most horrible forms.

"Here, help me roll both of these poor chaps over," Millstein ordered. "I see that scientist Benson obtained samples of the dead men's stomachs. You recall, Benson is the one who discovered that arsenic was the method of murder. Here hand me the dissecting knife! I want to get a piece of flesh from each dead man's hip. There is less circulation of the blood in that portion of the human body."

With quick, untrembling hands Millstein secured his two desired pieces of flesh. Working rapidly, the two rolled the corpses over and covered them with the sheets.

Back in the adjoining laboratory, Millstein, assisted by Cromwell, worked swiftly with testing reagents and microscope.

A deadly gleam of determination was forming in Millstein's eyes as he proceeded from step to step with the test—a gleam which also held a strong element of bewilderment and amazement.

Finally Don looked up. Twice he had checked his chemical findings!

"Jack! It's uncanny. It's impos-

sible; yet it's true! It contradicts all the laws of chemistry and pathology!"

"What does, Don?" begged Jack.

"From each body of the dead scientists, I took about three cubic centimetres of flesh. Mind you, those specimens came from a part where the blood circulation is slowest. Now, get this! Both those pieces of flesh contain enough arsenic to kill a dozen men! Just like the rat's body! Don't you see, Jack? How did the arsenic get so saturated throughout the scientists' bodies? And the rat's? How could arsenic be impregnated all through the bodies? Arsenic is primarily a stomach poison. If they died from arsenic in food, which is the only way it could be unknowingly given to a victim, then they would have died long before the bloodstream could have distributed the poison all over the system. And even if this were not a fact, how could such prodigious amounts of arsenic get into and all through the bodies?"

"No! Jack! It's impossible. Something weird and strange happened to poor Simon and Picardy—something unbelievable that instantly filled their entire bodies with arsenic—as if it was shot into them with a mighty shot-gun!"

"And the same thing happened to the dead rat!"

CHAPTER VIII

FANGS TESTED

IT'S weird—unexplainable!" Millstein puzzled. "You see, Jack, we know Simon and Picardy were poisoned by arsenic. But how, in *Cosmos*, did all that deadly poison get all through their bodies, and in such astounding quantities? Jack! this begins to look, more and more,

like the 'Falcon's' work. If it had not been for the dead rat we would have, perhaps, never known of the vast amount of poison impregnated throughout the scientists' bodies. The question is—how did the murderer administer such a terrific quantity of arsenic?"

"But, Don, it's impossible to suppose that the 'Falcon' is in these laboratories. Where could he hide? How could he have gained entrance? You know of the elaborate safeguarding precautions the government takes to protect this place!"

"Yes I know," mused Millstein, with eyes closed and brow furrowed. "Maybe the 'Falcon' is here, and not hiding! Perhaps one of the three scientists is really the skilled and murderous 'Falcon'!"

"What!" cried Jack. "How could that possibly be true? These three scientists are well-known to the Secret Service. They are highly trusted, and besides, none of them even resemble the 'Falcon'! It couldn't be that!"

"Just the same, I'm very seriously considering that possibility. You know, Jack, what a genius the 'Falcon' is for disguise and impersonation. There is no limit to the depth of his scheming initiative! When we get back to the administration room, I'm going to phone Billy Weston for more personal information about the three scientists. I want to know all about their scars, birthmarks and the like."

"Do you really think that one of the three scientists might be the 'Falcon'?" Jack fairly gasped.

"Of course I'm not sure," Millstein stated. "But one of those scientists is a deadly killer; and if the evil brains of the 'Falcon' are behind this—anything is possible!"

"I wish you'd turn in and get some sleep, Chief."

"No, Jack, we must work fast. Our first clue, the arsenic in the dead rat's flesh, points to Verick. And if Verick is the guilty one and happens to notice the rat is gone he is going to act. And we must act first!"

"What are you going to do?"

"I haven't decided yet; but, first, we're going to test the poisons, if any, in those devilish devices—the cigarette lighter fangs and those ingenious rubber mats and needles. Where are they?"

Without hesitating, Jack placed the gruesome articles on the laboratory bench. "I'm glad to get those out of my pocket!"

Millstein carefully squeezed some of the vicious-appearing, green fluid into a test tube. He applied several testing acids and checked the rapid, chemical reactions. After a few more tests he looked at Cromwell with serious, determined eyes.

"It's some sort of deadly, reptile poison! The stuff reacts like cobra venom! I do know that a trace of it would kill a man in a few moments! Jack, you know how the 'Falcon' loves to experiment with reptile virus. This poison is some terrible mixture of venom from various man-killing serpents!"

Millstein working quickly, found that the same deadly poison was in the cigarette lighter fangs and in the remaining rubber disc!

"Jack, we certainly have to cope with an infernally clever and murderous mind. If it had not been for our vast luck, these little death-traps would have sunk their fangs into us—to say nothing of the bomb in the brief-case!"

"We're going back to the administration room. Bring scientist Ben-

son to me. I want to question him again. He is a graduate medicine doctor; and it was he who first discovered that Simon and Picardy had been killed by arsenic. You recall how quick Benson is with his hands? It seems to me that a man with such quick mental and muscular reactions would have noticed something peculiar about the amount of poison in Simon's and Picardy's alimentary tracts!"

MILLSTEIN, seated at the large desk in the administration office, stared sharply at scientist Borgnan Benson.

"Professor Benson," shot out Millstein, "I have to ask you some pointed questions. You can best prove your innocence by helping me net the murderer."

"Proceed," stated Benson, calmly, "I am quite ready to assist you in every way."

"A cool one," Jack reflected as he poised himself watchfully nearby.

Millstein leaned forward and began with rapid-fire interrogation.

"Benson, has any attempt been made on your life?"

"No!"

"Has any been made on the lives of Bronsky or Verick?"

"No! At least, not that I know of. I'm sure they would have told me."

"Why would they have told you?"

"Because they know I'm a physician, and they sent for me when poor Simon and Picardy were stricken."

"Benson," snapped Millstein, "you have made a special study of poisons. Secret Service tells me you studied toxicology in Hampton University—you know all about poisons!"

"No, sir, I don't," came in startled tones from Benson; "yes, I majored in toxicology—but I gave up my med-

ical practice years ago to become a government scientist. I'll have you know, Mister Millstein, that I'm a good American—"

"Hold your temper!" snapped Millstein. "I can't spare your personal feelings. I have to catch a murderer and you are one of the suspects!"

"I'm sorry, Millstein. Proceed."

"Where were you when Picardy and Simon were first taken ill?"

"I was in my workshop, number forty, which has been my lab ever since I've been here. Simon and Picardy were working with Verick and Bronsky on some special tests in laboratory number ten, when Simon was taken violently ill. We all took him to lab forty-four. I gave Simon treatment of a general nature, for, at first, I did not suspect poison. He grew dangerously worse with alarming rapidity. I was then amazed to note unmistakable symptoms of arsenical poisoning. I did everything within human power; but poor Simon died in three hours after first complaining!"

"Why did you perform an autopsy on Simon?"

"Because I was astounded to see the arsenic kill him so quickly. I wanted to be sure. I found that his death was caused by arsenic poisoning. I cannot understand why he should have died so quickly; except though, I thought, until Picardy died, that, maybe, Simon had suffered a long time before he complained. You know, Millstein, there have been such strange, medical cases of amazing fortitude and stoicism, even where terrific agony was indicated. But poor Picardy began to complain the next day and in spite of my best first aid and antidote measures, he, too, died in three hours and from the same cause."

"Now, Benson, please consider this next question very carefully, before you reply. Did you find any other extraordinary conditions about the poisoning, besides the strange fact that both men died much quicker than is usually caused by arsenic?"

Benson considered mightily. His big face and steady, blue eyes indicated his mental stress; his answer came slowly, but in a positive manner.

"Well, my autopsy showed an amazing amount of arsenic in the stomach and intestines. It seems to me that it would be impossible for a human to, even deliberately, swallow so much arsenic. It's quite bewildering!"

"Did you report this strange finding?"

"No! I was confused. I was not sure. I'm not certain now. It's been a long time, since I have practiced medicine."

"Benson, do you expect an attempt on your own life?"

"I do! I feel sure that I would be a dead man, by now, if you had not arrived and locked each of us up! I think you have the situation under control."

"Thanks. And where was Picardy when he first complained of being ill? Please consider this carefully."

"Why," hesitated Benson, "let's see. Of course, he was in lab number ten, working with Verick and Bronsky. They—"

"Ah!" interrupted Millstein. "Things of a sinister nature seem to have developed in room ten! Simon developed his fatal symptoms in lab number ten! We will have a look into lab number ten! Thanks for your splendid cooperation. Jack, escort Benson to his room. I regret to have to keep you locked in."

"Think nothing of it," rumbled the huge Benson. "In fact, I demand to be locked in! It's safer!"

CHAPTER IX

LABORATORY TEN

"**W**E'LL stop at room forty-one. I want to ask Bronsky some questions." Millstein said, as they stepped into the hall.

Cromwell asked: "What are you expecting to find in the mysterious lab number ten?"

"I don't know, my impatient one, but it seems significant of something important that both Simon and Picardy were first taken ill in room ten. Here's forty-one! Watch Bronsky's face closely!"

It required a few seconds to unbolt the strong door. The efficient Cromwell had made a secure job of the bolts. Millstein rapped authoritatively on the thick door panel. "Open up, Bronsky, it's Millstein!"

They heard, from inside, a nervous fumbling with the lock. The door opened and the excitable Bronsky instantly began a nervous tirade.

"Be calm, Bronsky," Millstein placated the scientist. "I want to ask you a few questions."

"I can't work!" piped out Bronsky; his high-pitched tones were highly lugubrious in comparison to his mighty frame. "These horrible murders have me all upset. I tell you, the murderer will kill me next! I know too much about the Brenizer Ray!"

"Snap out of it, Bronsky! You will not be harmed. No one can get at you. I'm in a hurry; pull yourself together! Answer my questions!"

Millstein's sharp ringing voice seemed to help Bronsky gain partial control of his emotions. He, finally, nodded in a nervous manner to indicate that he was ready. Don wasted no time.

"Bronsky, where were Simon and Picardy when they first complained of their fatal poisoning?"

Bronsky took a long time to consider; but when he spoke his voice was quite calm and decisive.

"Both Simon and Picardy had been working in laboratory number ten when they first complained of illness."

"Good!—and how long had they been working there before they began to suffer from the primary stages of the poison?"

Again, Bronsky cogitated, long and carefully.

"I'm positive they were both there for several hours before they took ill. You see, we were all working on an important test—a Brenizer Ray experiment. We—"

"Ah!" interrupted Millstein. "Now we're making progress. It's certain now that Simon and Picardy were poisoned in lab ten, with vast quantities of arsenic—but without their knowledge! And that is a hard problem to solve! Bronsky, you are to come with us, at once, to lab number ten! I want you to show me exactly where—and how—and what Simon and Picardy were doing!"

With an ape-like whimper, Bronsky began to chatter with excitement and fear. Millstein knew the scientist was either greatly afraid, or else he was a most clever actor. Don quieted him with a few terse phrases, and led the way to laboratory ten.

Laboratory ten proved to be an exceptionally large and well-equipped

testing and experimental room. Here were machines so delicately balanced they would weigh the mark of a pencil on a piece of paper—machines to test tensile strengths and degrees of hardness of metals—X-ray apparatus and many others, both simple and intricate. It was the finest testing plant Millstein had ever seen.

"Lock the doors, Jack. And now, Bronsky, show me where Simon or Picardy were working for one hour, at least, before they took sick. Be careful! Think well! For if you can answer this question accurately my work is half done!"

"Let's see," mused Bronsky. "I was working at that bench over there. Why! I remember very well! Picardy was working at this bench—with that portable, photographic microscope! I'm sure! He was working there for at least two hours, before he began to complain!"

"Cosmos!" snapped Millstein, as he examined the microscope with shining eyes—dark orbs gleaming like those of a religious devotee. "Now we're making headway! Who was working with, or near, Picardy?"

"Why, Benson and Verick were working right there, only a few feet away! And I—er—I was over there!"

While talking, Don and Jack had made a thorough examination of the large, complicated microscope.

"There's nothing about this microscope which could have poisoned poor Picardy." A sudden inspiration came to Millstein. He fairly shot out:

"Bronsky, was Simon, by any chance, around this bench and microscope before he died?"

Bronsky started as a man suddenly shocked with a powerful, electrical current!

"My God! Millstein. He was! Yes, I recall, Simon, too, was working at this bench an hour or so before he got sick!"

"That means something, Chief!" Cromwell burst in. "We're on a hot trail!"

But Millstein, for the moment, seemed totally oblivious of the other two men. His keen eyes were going over the large bench and mechanical equipment with detailed care. No object, however small, escaped his searching glance. After a long, tense interval, Millstein's eyes paused on a large X-ray apparatus, suspended on an overhead, swinging beam. Millstein, from his long scientific training, knew instantly the apparatus was an X-ray machine. His practiced glances noted the heavy electric wires leading into the transformers and instinctively his scrutiny fell upon a large, lead plate on the bench.

Going to a switch-box nearby, Don started to throw the switch. Again that mysterious something—that vague, but insistent warning of danger flooded into his brain! He moved his hand from the switch. It was now he saw that Jack and Bronsky were standing directly under the muzzle that projected the X-rays when the current was turned on. Millstein started evidently with a quick thought!

"Bronsky!" from Don. "Does that overhead X-ray discharge-muzzle always hang, poised, over anyone's head who might be working at this particular bench?"

"I guess it does, I never noticed it, before."

In a split-second, Millstein leaped to the bench-top, where he could better study the swinging muzzle of the X-ray machine.

Jack, ever alert, noticed Millstein was coding to him in finger message!

Jack's face fairly glowed with excitement as he watched Millstein's fingers spell the words—

"When you return, bring six live rats!" Jack knew that other verbal instructions were coming. They came!

"Jack! please escort Bronsky to his laboratory room. Lock him in securely and return at once! Thank you, Bronsky. You've helped me a lot—more than you realize!"

IT was a half-hour before Jack, with breathless curiosity, returned to Millstein. In his hand was a small wire cage containing six live, white rats.

"Have you found something big, Chief?"

"I don't know, Jack, yet. Look at this long rubber cord, fastened very cleverly on the muzzle of this X-ray machine—the rubber cord always pulls the muzzle, see! so it stops directly over the head of anyone working at this bench! And Simon and Picardy got poisoned there!"

"But isn't it only an X-ray device?" asked Jack.

"We're going to find out, Jack. Place the white rats on that lead plate. There! Now swing the muzzle—cut the rubber cord—so it is directly over the rat cage. And stand far away from the bench! I'm going to start the X-ray machine!"

Wonderingly, Jack drew back as Millstein threw the switch to conduct the electrical energy into the X-ray coils. The great rotors of the machine began to whirl with blinding, almost silent, speed. Vaporous, writhing clouds of seething energy whirled in the large glass tubes.

"Stand well clear of the bench, Jack! I'm suspicious of those X-rays. Watch the rats closely! If anything develops, call me! I'm going to look around this lab."

An hour passed—an hour that was an eon to the impatient, but watchful Jack. He was strangely fascinated by the soft whine of the whirling rotors and the dancing, twisting streamers of energy. Slowly, reluctantly, his glance swung back to the cage of white rats. He stiffened—started forward and stopped when Millstein's warning came to his mind; a warning to stay away from the X-ray machine, while it was functioning!

A startled cry burst from Cromwell's lips; a signal which brought Millstein to his side posthaste.

Both men stared with incredulous eyes at the white rats! Four of the rodents were lying flat on their backs, with legs waving feebly; the other two were staggering about with unmistakable signs of agony!

With a quick leap, Don shut off the X-ray apparatus, and with a stick pulled the cage from under the X-ray muzzle.

"Jack, fetch me the testing acids and microscopes from lab forty-four! Quick! I'll dissect this large fellow that is now quite dead, while you're gone!"

Jack was Mercury on his swift errand.

"WE'VE got it, Jack!" cried Millstein, looking up after careful and painstaking labors with acids and microscope. "The six rats are dead—from arsenical poisoning! The X-rays from this machine poisoned them—as they poisoned Simon and Picardy! But how, Jack, how?"

CHAPTER X

MURDER BY ATOM

"JACK, we have located the death device! In a weird, strange way this uncanny machine puts arsenic in any living body within the range of its deadly rays. How? Cosmos only knows! But I'm going to find out! Some human mind devised this damnable device, therefore I can determine its awful secret. This is the 'Falcon's' work! One of those scientists is the 'Falcon'! For this is the strangest and most unique method of murder ever devised by human mind!"

"Do you think, Don, that the X-rays in some mysterious way carry or shoot atoms of arsenic into the bodies of its victims? That would account for the arsenic being spread throughout the bodies!" Cromwell was a splendid scientist.

"No, Jack! It has to do with atoms and electrons; but the method is far more subtle and involved than that—yet it's more simple! For this is the 'Falcon's' work!"

"What is the method?" Jack begged.

"I don't know—yet!" Don said, "but I will soon!" A sudden thought flashed into his shrewd mind as he turned to Jack.

"Hurry, Jack, and add more locks to the doors of the three scientists. Be sure, first, they are inside. Phone each one to make certain he is locked in—then fasten them in beyond any possible question that they might release themselves! There is not a chance in a million that the guilty one has been able to escape our outside locks; but make certain, and then fasten the doors with more bolts! When you phone them, say nothing to arouse their suspicions.

Tell them I'm asleep—resting; and that you will bring them food later. And Jack, after I've solved the mystery of this X-ray machine, I've a plan that will trap the murderer! A trap which will not fail! Hurry back!"

WHEN Jack returned to room ten he found Millstein absorbed in some highly-intricate research work. Strange appearing diagrams were spread out on the bench. A small part of the X-ray apparatus taken from the ray-muzzle lay on the bench. It was evident to Jack that Millstein had dismantled part of the large machine. Millstein was examining a small part of the machine with the microscope. Finally, he raised his head from the eye-piece and turned to Jack.

Cromwell anxiously noted the tired, drawn lines of Millstein's face.

"Don, why not get some sleep? You've been going for forty hours, now." Jack knew his plea was futile, even as he spoke. He recognized the implacable determination inexorably creeping over Millstein's face. Jack knew this mighty will to find the truth always predominated in his fighting chief, when seemingly insurmountable obstacles were met. Jack, from past experiences, knew Millstein would never sleep, or rest until the mystery was solved—and the killer trapped. The famous scientific man-hunter was now challenged with a problem worthy of his uncanny skill! A puzzling riddle—how was the arsenic literally "saturated" throughout the victim's bodies? A proven truth—the X-ray machine introduced the fatal poison—but how?

"What can I do to help?" Jack asked.

With a start, Millstein looked up.

His mind, concentrated to the intricate problem at hand, seemed to return from distant space.

"Oh, yes, Jack," Millstein's voice had the effect of coming from a vast distance. "Sit here and make me up a list of the ninety-two known chemical elements. Please list them numerically as to atomic number and atomic weight." With that, Don turned again to the high-powered microscope.

"Okay, Chief," from Jack as he reached for pencil and pad and began to write—Hydrogen—atomic number 1, atomic weight 1.008. Helium—atomic number 2, atomic weight 4.00—"

For two hours, Millstein racked his trained brain as, with infinite care, he analyzed the strange, intricate part he had removed from the muzzle of the X-ray machine.

Step by step, an incredible theory was forming in Millstein's analytical mind—a mad theory which was slowly becoming fact!

For the erudite Millstein was considering matter and its composition. He knew that all matter was formed of atoms, which in turn are made up of electrons, positive and negative. His racing thoughts were reverent at the mighty smallness of electrons, whirling and speeding orbitally in an incomprehensible, but well-ordered, numerical scheme of life and motion. What strange force directs with such precise, mathematical laws the flights of the tiny electrons and the mightiest star-spheres? Millstein marvelled at the wonder of things—the smallness—the vastness!

"Jack!" he said, suddenly, "how far have you listed the elements?"

"I'm slow, Chief, my chemistry is rusty. I have them listed as far as germanium, which is number thirty-

two in the atomic scale. But what comes next? Bromine?"

"No, Jack!" replied Millstein. "Arsenic is element number thirty-three! And selenium is element number thirty-four! I've got it!"

"WHAT?" shrilled Jack.

"Yes! I've found the answer. I've found out how this X-ray machine puts poison into the bodies of the murderer's victims. No, I don't mean just that. I mean to say that the X-ray machine does the deadly work—but the poison was already in the victims' bodies!"

"But how?" protested Cromwell. "How did the poison get into the bodies?"

"It was not put there, my impulsive one, it was already there!" Millstein's smiled, the slightest bit, at the profound bewilderment on Jack's face; "You see, Jack, if my theory proves correct, the poison, in electronic form, is always present in every living body!"

"It's getting worse," Jack grunted.

"Be patient, my impetuous one, for a while. I've got some hard work ahead. Here, take that little gadget apart. Be careful! It looks like a transformer coil. It is! That clever little device is no part of a standard X-ray machine, and in some way it affects the X-rays so they change the numerical composition of electrons within atoms. Here! Let's connect it up again and test it. Be cautious! Don't get into the stream of rays!"

Working with amazing speed and skill, Millstein made test after test. Between each mechanical experiment he would cover sheets of paper with involved calculations.

It was hours later, when Millstein, tired and drawn, rose from his labors.

His dark eyes were flashing with triumph.

"We've got it, Jack! I know how the murderer killed Simon and Picardy. They were killed by arsenical poisoning! They were killed by this machine! Every human body contains a small per cent of selenium, which is element number thirty-four in the atomic scale! The clever fiend, no doubt the 'Falcon,' placed this ray transformer in the X-ray muzzle. The changed and distorted X-rays transform the selenium atoms, in the victims' bodies, to arsenic atoms! Arsenic is element number thirty-three—and selenium is element thirty-four! A clever diabolical scheme of murder! A new and astounding way to murder! Don't you see, Jack?"

"Yes, perfectly!" answered Jack. "And now, Millstein, won't you please tell me how Simon and Picardy were murdered? You've got me all mixed up! You say the X-rays did it; and then you say the poison was already in the bodies! I can't get it. What kind of murders are these?"

"Murders by atoms!"

CHAPTER XI

ATOMIC SOLAR SYSTEMS

ONCE more, Millstein made a rapid check of his calculations and with agile fingers drew two circular diagrams.

"You see, Jack," he explained, pointing to the drawings, "this is a rough sketch of an atom of arsenic, which is element number thirty-three. Note carefully that the atom of arsenic contains seventy-four positive electrons and thirty-three negative electrons. Now, look at the atom of selenium, which is element number thirty-four in the atomic scale. See? Each selenium atom contains

seventy-nine positive electrons and thirty-four negative electrons!"

Cromwell stared, with bulging eyes, as Millstein continued academically.

"Every human body contains millions of selenium atoms which are beneficial; for selenium occurs in native sulphur—a great remedial element for man. But this X-ray, when transformed or distorted by this devilish, little, transformer gadget works a horrible miracle with the selenium atoms! By some strange, numerical influence it causes every selenium atom to lose five positive electrons and one negative electron! You get it? Thus all the selenium atoms instantly become arsenic atoms!"

"I see it!" burst out Jack. "When the selenium atoms lose five positive electrons and one negative electron, each atom then has the same atomic number and weight as an arsenic atom! In fact they become arsenic! So, when a person gets under the deadly ray all the selenium in his body becomes arsenic! And that is why the bodies were so thoroughly saturated with arsenic!"

"You're right. And it's the 'Falcon's' work! And now to catch him!"

Millstein paused to consider his next move, and with a few words he summed up the situation. "One of the three scientists is the murderer! I feel certain he is the 'Falcon'! This X-ray machine is now harmless, and none of the three scientists know that. In fact, Jack, they don't even know we have discovered the secret of the deadly machine. And that's how I'm going to trap the killer! You will bring the three scientists to me, one at a time. I will be working here at the bench on some Brenizer Ray figures. The X-ray muzzle will be

directly over my head. I will ask each scientist in turn, to sit here—under the muzzle and help me with some calculations. The X-ray device will be running at full speed! The guilty one will refuse to sit here—will refuse to come under, what he thinks is a deadly ray! Now, Jack, bring me scientist Benson first. And leave me alone with him!"

"Say, Don, maybe you had better let me stay with you. If the killer is the 'Falcon', you may need me."

"No! That's all the more reason I want to be alone with the suspects. Hurry!"

With a worried frown, Jack sprang away.

"OH, hello, Benson!" Millstein greeted the government scientist. "Sit here with me. I want to get your opinion on this Brenizer Ray calculation." With that, Millstein motioned Benson into a chair, directly under the muzzle of the X-ray apparatus. Don then turned to see if Jack had left the room. He had; and had locked the door.

Without the slightest hesitation, the mighty Benson slid into the chair! His big, blond face turned mildly and inquiringly toward Millstein. His huge, baby-like face was bland and guileless.

Millstein stared with boring, watchful eyes; he carefully studied Benson's every move and facial expression. Suddenly, Benson's attention was attracted by the whirring and hissing of the X-ray apparatus. He glanced upward and looked quite calmly at the X-ray discharge muzzle directly over his head. He turned to Millstein without the slightest perturbation and spoke slowly.

"Millstein, you've left your X-ray machine running."

"Yes, I know," replied Don, eyeing the other closely. "It has a tight rotor bearing and I'm running it in, before I start a long and important experiment."

"I see," stated Benson, as if dismissing a trivial matter, "and what is your Brenizer Ray problem?"

For a half-hour, they sat concerned with abtuse calculations, invented with extemporaneous shrewdness by Don. Above them, the great X-ray rotors whined and the ripping, streaking energy seemed to snarl out a mad threnody.

But, to the watchful Millstein, Benson gave no hint of fear or nervousness—in fact, he seemed to have forgotten the X-ray device.

"Strange!" Don reflected, "Benson must be innocent or he would be fearful of the X-rays." A sudden conviction flashed into Millstein's thoughts—that Benson was innocent.

"Benson," Millstein blurted out with startling abruptness, "I'm convinced of your innocence. You have just passed a severe test; never mind what kind of a test it was! If you want to prove it, beyond any question of a doubt in my mind, strip off your clothes!"

Without a word, the agile Benson began to hastily throw his clothes on the floor! Finally the fine, naked body of Benson stood before Millstein.

"You're not guilty, Benson!" cried Don, extending his hand. "Shake! I'm glad of it."

Millstein did not tell Benson his reason for asking him to disrobe; that he wanted to be sure the scientist wore no protective lead-lining under his clothes! The guilty one, Millstein reasoned, might wear such a protection against the deadly, con-

verted X-rays; for the mind, shrewd enough to devise such an amazing method of murder, would take unusual and scientific precautions against discovery.

"I'm very grateful to you, Benson, for your fine cooperation. It's a great relief for me to find you guiltless," Millstein said, as he signalled for Cromwell.

"Here, Jack, please escort Doctor Benson to his room. Lock him in. Bring Petgard Bronsky back with you."

"I am most happy about what you said, Millstein," from Benson in happy tones as he followed Jack. That wondering, impatient person looked imploringly at Millstein as he moved away in advance of the bewildered, but happy Benson.

MILLSTEIN re-arranged the bench and chairs for scientist Bronsky. He recalled the strange nervousness and constant terror of Bronsky. He made a quick inspection of his trap as he heard Bronsky and Cromwell approaching. The excitable Bronsky broke, at once, into a furious chattering.

"I tell you," he ran on, "I'm through! My nerves are gone! I demand to be sent to the surface! I can't work, with these murders going on. The government has no right to hold me! I—"

"Don't become excited, Bronsky," Don soothed, "we are about to trap the murderer! You want to help, I know. Sit here with me. I want your advice on some technical matters."

Millstein made a great pretense of arranging papers on the bench; but not for an instant, did he remove his eager eyes from Bronsky's twitching face. Again, the hawk-like eyes of the super-scientific detective noted that

Bronsky's hands were quite steady!

"Sit here, Bronsky, and work with me. Here at this bench." As Millstein spoke, he moved into a chair directly under the X-ray machine's muzzle and pulled an empty chair beside him. Millstein tensed, as he glanced to see if Cromwell had departed; for Bronsky was still standing. His blinking, frightened eyes were appraising the X-ray machine above him. He refused to place his body under the rays! Don rose, ready to meet any emergency; for Bronsky was a powerful, physical specimen!

"Why is that X-ray machine running?" demanded Bronsky with bulging, jerking eyes and puling lips.

"It has a new rotor bearing," explained Millstein, watching the other with analyzing interest, "I'm running it in, before I start some important experiments."

"But we'll be under the X-rays if we sit there. I am afraid of the rays; they're not good for people!"

Millstein's heart exulted! Bronsky was afraid of the rays! It looked bad for the nervous scientist! Millstein's voice rasped hard as a diamond on an abrasive wheel:

"Bronsky, my time is valuable! I dislike to have you quibble about such a foolish thing! The rays will not hurt you! You know that! I order you to sit with me, here!"

In spite of his astounding life of action and dramatic adventure, Millstein was astonished at Bronsky's next move! For, by now, Don was convinced that Bronsky was guilty.

With a vast sigh, Bronsky suddenly dropped into the chair Don had indicated! The scientist seemed to have obtained control of his fears and nerves; and, without paying the slightest heed to the X-ray device

above his head, he muttered apologetically:

"Sorry, Millstein. It's my nerves. Let's go to work!"

The unexpected action of Bronsky was a great surprise to Millstein; it required all his self-control and presence of mind to engage the scientist in a difficult and relevant calculation.

Even while working with Bronsky on mathematical calculations, Don was thinking.

"Bronsky is innocent, or he would not risk certain death under the X-rays. He is not the 'Falcon'!"

For a full hour, Bronsky worked; apparently he had forgotten the hissing, snapping X-ray apparatus above his head. Bronsky had removed his coat and vest; Millstein could plainly see that he wore no protecting lead garment.

Millstein, now convinced, rang for the anxious, curious Jack, who appeared with suspicious, genii-like alacrity.

Hastily thanking Bronsky, Millstein instructed Jack to escort the scientist back to his work-room. After the two had moved away a short distance, Millstein called Jack, who bounded back like a sprinter.

"Cosmos! Chief! What have you found out?" Jack fairly hissed in his excited curiosity.

"No time to explain in detail, now," whispered Millstein. "Benson and Bronsky are innocent! I'm sure of that! Verick must be guilty! Bring him! Don't arouse his suspicions and watch him! When you bring him in here, lock the door! And this time you are to stay and help!"

"Oh! thank you, Chief. That's great!" Jack's reckless eyes fairly snapped with delight; "You may need me!"

"And get this straight, Jack! After I get Verick seated and working until he is not suspicious, you suddenly throw on the switch that starts the X-ray machine! Then watch Verick! Beat it, now!"

"Okay, Chief, okay!"

CHAPTER XII

THE TRAP IS SPRUNG

MILLSTEIN had stood in the shadow of death so often that he had developed a strange, sixth sense—a nervous reaction to any danger that lay ahead.

His nerves were tingling, as he waited for Cromwell to bring scientist Milton Verick. He possessed a strong apprehension that he was facing a great test; a struggle of mind and body against a most powerful enemy. Surely, Verick must be the guilty one; but how could Verick be the "Falcon"?

No observer, however vigilant, could have divined the tense concentration of Millstein's mental faculties as he reposed at the bench, waiting for the suspected scientist. But, under that suave, polished manner was a keen and mighty realization of the dangerous enemy at hand. He mentally reviewed the situation:

"It seems certain that Benson and Bronsky are innocent; if guilty, they would have refused to sit under the X-rays. That leaves only Verick; but Verick calmly whirled the ignitor of the deadly cigarette lighter! Surely, the murderer of Simon and Picardy planted the death devices for Jack and me!" Don's ruminations were interrupted by the arrival of Jack and Verick.

"You sent for me, Millstein?" Verick's deep voice boomed. "What

do you want of me? Have you found your murderer?"

"Yes, to your first question, and no, to your last. Verick," Millstein appeared to be in a careless, friendly mood; "perhaps you can help me catch the murderer. I'm stumped!"

"What progress have you made in your investigations?"

"None," Millstein lied, "except, I've come to the conclusion that arsenic did not cause the death of Simon and Picardy!"

It was a shrewd deception and Don eagerly, but surreptitiously watched the face of Verick for any betraying emotion.

The young super-detective fancied he caught a fleeting glint in Verick's dark eyes—a ghost of a triumphant flicker!

"But," protested Verick, "Benson claims to have found arsenic in the bodies!"

"Yes, granted—a clever trick of the killer to hide the true cause of death! Verick, that arsenic was put in the bodies after death!"

Verick considered mightily; he appeared to be puzzled and hesitated in his reply. Millstein congratulated himself on his deception; his clever ruse had completely upset Verick's composure!

Finally, Verick gave a shrug of his powerful shoulders and grunted: "You may be right, Millstein."

"I'm sure I am," Millstein burst out with simulated enthusiasm; "sit here and let me show you something!"

The unsuspecting Verick dropped into the chair indicated by Millstein, who made a great pretense of looking for a certain paper on the littered bench.

With vast and pretended nonchalance, Cromwell had strolled to

a near-by place of vantage, where he could instantly throw the switch of the X-ray machine! Eagerly and tensely, Jack waited for Don's agreed signal!

Verick sat quietly; there was no hint of his thoughts on his strong, lean face.

"Here's what I was looking for," exclaimed Millstein, as he sorted out a certain paper. His right hand strayed upward through his dark hair. It was the agreed signal!

Cromwell threw on the switch of the X-ray machine!

The room was instantly filled with the whine of the rotors—a whine which accelerated into a crescendo shriek; its tempo weirdly timed by snapping, streaking electrical energy!

THE body of Verick grew rigid; his suddenly bulging eyes turned upward! For a moment he gazed at the X-ray muzzle above his head—stared as if strangely fascinated! The look of astonishment on his granite-like face slowly metamorphosed into pure horror!

Millstein carefully analyzed the play of emotions over Verick's face.

Suddenly, with an animal-like snarl of rage, Verick threw himself backward. He crashed heavily with his chair!

"You have poisoned me!" he frothed insanely. "You blundering fool. You—" Verick paused with startling abruptness as he realized his serious, verbal mistake. He drew back like a dangerously wounded tiger at bay.

Millstein, fully aware of the vast resources and devilish cleverness of the killer, advanced cautiously. His voice rang loud and clear above the noise of the X-ray machine.

"Milton Verick, I arrest you for

the murders of Simon and Picardy!"

"Curse you!" rasped Verick, snatching an automatic pistol from his coat pocket, "come and get me!" The pistol, actuated by Verick's eager fingers, spewed forth leaden death!

Millstein plunged heavily to the floor; fell like a sack of lead ingots. As Verick's hand flashed out with the lethal weapon, the quick-thinking Millstein had started to fall; unarmed, he knew it was his only desperate chance. As he struck, he began to roll with surprising speed toward the killer. Millstein, although his writhing, looping body afforded a poor target, felt the tug of a leaden slug at his hair. And, as he heard bullets ricochet screaming from the cement floor, he saw the lithe body of Cromwell catapulting through the air toward Verick!

The watchful Jack, on seeing Verick pull his pistol, had made a short run and hurled himself at Verick.

Crash! Jack's hurtling bone and sinew struck Verick, who was dashed with great force against a nearby steel column. While still in the air, Jack clutched the dangerous automatic; but now, the mighty Verick grasped his attacking enemy with gorilla-like arms.

Cursing his laches for not arming himself and Jack, Millstein sprang toward the two struggling men. Then Millstein gasped in horror as he witnessed a most astounding feat of strength! Verick, with a single surge, lifted the struggling Cromwell high above his head—as Hercules lifted Antaeus! But the faithful and courageous Cromwell, even while held suspended, like the sword of Damocles, did a most courageous thing; he threw the pistol, he had wrested from Verick's hand, to Millstein!

With a sure clutch, Millstein

plucked the flying gun from its flight and whipped its muzzle toward Verick.

But Don did not have time to prevent Verick dashing Jack upon the hard floor—as one would fling down an old coat!

Jack struck with a sickening thud and lay inert.

"Stop!" yelled Millstein. "Hands up! or I'll fire!"

"Go ahead! fire and be damned!" screamed Verick, rushing at Don with out-stretched, claw-like hands!

Without compunction, Millstein fired twice at the charging body of Verick. Each time he saw Verick's coat twitch from the impact of the enraged monster—unharméd!

The automatic clicked empty and Don reversed the weapon to use it for a club!

"He's wearing a bullet-proof vest!" thought Millstein as he waited tensely for the greatest combat of his life. A lifetime of mental and physical training had fitted him for this ordeal. No two, ancient, Roman gladiators ever faced each other with such deadly intent and skill as Millstein and the "Falcon."

For Millstein knew, now, he faced his sworn enemy—the "Falcon"!

CHAPTER XIII

THE COMBAT

AS Verick lunged forward, Millstein dared a quick glance to orientate himself with surrounding obstacles. Like a panther, he leaped to one side and easily avoided the first bull-like charge. Don realized he must not let Verick close with him; for he knew the other's prodigious strength. Millstein was a powerful man, highly skilled in boxing and wrestling; but he had a

profound respect for the crazed scientist's physical powers.

Realizing his antagonist was infuriated and that such fury was a decided advantage, Don taunted Verick, as he leaped away.

"So the great 'Falcon' has turned out to be a common murderer!"

The result of his flout was more than Millstein expected. Verick paused for a split second, his cruel eyes gleaming insanelly; but with vast resolution and murderous purpose.

"Damn you, Millstein! So you've found out I'm the 'Falcon'! Of course I'm the 'Falcon'! And the 'Falcon' always kills!"

Without reply, Millstein suddenly leaped forward and swung the pistol with crushing force! Even as he struck viciously, he darted away. He must keep clear of those mighty arms!

Smack! sounded the pistol; but it struck only the grasping hand of the "Falcon."

As Don wheeled, to turn like a flash, his thoughts raced warningly.

"Cosmos! I must be careful. He's quick as light with his hands. He—"

Millstein barely jerked his head aside to dodge the whistling automatic, which the "Falcon" flung with fearful force!

"So you killed the real Verick and took his place?" sneered Don as, with cat-like agility, he avoided another charge. "You even had your evil face rebuilt to look like Verick!"

"Yes!" frothed the "Falcon," poisoning for a leap. "I had you fooled, too, until you poisoned me with the X-ray machine! But you were under it! You are poisoned, too! We're both doomed to die from arsenic poison! But I'll kill you first, with my bare hands!"

Millstein laughed in the voice of Stentor; the "Falcon" thought they were both poisoned from the X-ray machine! The murderer did not know that the deadly machine was now harmless! He did not realize that Millstein had discovered the X-ray device's awful secret! "This is too good," Don thought, "the 'Falcon' thinks the starting of the X-ray device was just an unlucky accident!"

A low moan came from the floor! Cromwell was regaining consciousness and his inert body began to jerk!

The "Falcon" snatched up a heavy wrench from a bench, and raised it to strike the prostrate Cromwell.

With a berserk cry of rage, Millstein leaped forward as though flung from a catapult!

With all his fury and fine strength, he swung his right fist into the "Falcon's" face; some uncanny instinct told him it was useless to pound into the giant's body.

SSMACK! The "Falcon's" head jerked backward and Millstein felt the sudden agony of shattered knuckles!

The "Falcon" was flung backward and the heavy wrench flew from his hand, as broken teeth spewed from his bleeding lips. Like a wounded grizzly, he shook his head to gather his numbed wits. Mighty as he was, the "Falcon" had suffered from that blow!

The killer leaped forward, screaming with rage, lusting to kill! Millstein sprang backward and tripped heavily over Cromwell's body. With a savage yell of joy, the "Falcon" hurled himself upon Don, his sinewy arms grasping with crushing power!

Millstein was trapped; he knew it was certain death, unless he could escape those terrible arms of steel!

With a grunt of fiendish pleasure, the "Falcon" began to tighten his strangle hold with all his inexorable strength.

"I've got you at last!" gasped the "Falcon." Don could feel his enemy's strong muscles trembling from strain.

Millstein waited as long as he dared, and just as he felt his body could withstand no more agony, he risked all on a desperate strategy—a ruse which required all his great fortitude and muscular control.

With a groan of simulated agony, Don suddenly relaxed his muscles—all but his powerful neck and chest muscles! He held his breath and waited until his senses reeled! It was a supreme test of endurance, made possible by years of clean living and rigorous, technical training. The "Falcon" fancied Millstein was weakening and moved his hands for a neck hold, that he might strangle Don.

Summoning all his panther-like strength, Millstein snapped his legs upward! Like a cobra striking, his legs were instantly locked around the "Falcon's" corded neck! With the crushing power of a boa constrictor, Don tightened the sinews of his legs. His two strong arms flashed upward, grasped the "Falcon's" face by the effective expedient of thrusting his fingers deep into the "Falcon's" nostrils, and jerked the great head back!

The "Falcon" groaned in agony and his breath whistled shrilly through his squeezed wind-pipe!

With slow and deliberate tenacity, Millstein increased the fearful pressure of his arms and legs: he called upon every faculty of his splendid body. He strained his sinews and muscles until his brain reeled. He felt the heavily-corded neck of the "Falcon" give with the terrific strain of his leverage!

Toiling like Sisyphus climbing the eternal mountain, the "Falcon" rose slowly to his trembling legs; his gasping breath, nearly shut off by Don, came in agonized wheezes. Don used his last reserve of strength and tightened his deadly hold. With a racking sob the "Falcon" crashed to the floor! Don took advantage of this fall to move his arms to a more powerful leverage!

Fearing he would throttle the "Falcon," Don relaxed his hold the slightest bit.

Again, he taunted the "Falcon"; he wanted information.

"Tell me," Don panted, "why did you whirl the ignitor of the cigarette lighter, when you knew it was a death device?"

"I gambled that you had removed its fangs," gasped the "Falcon"; "besides, I had an antidote ready!"

"You fooled me for a time with that stunt," grunted Don, as he again increased the torturing pressure. "Is Verick alive?"

But the "Falcon's" answer was only a choking gurgle. Don realized that he had cut off the murderer's air! He relaxed his arms and legs the slightest and repeated the question.

"Where is Verick? Quick, or I'll snap your neck!"

"He is dead—I—kidnapped him—took him away—I—studied him—impersonated him—killed him—and took his place to—steal—the—secret of the—Brenizer Ray. With the—ray I could—control—ah— If it had—not—been—for the—poison—in—my—system—you could—not—have overcome—me—in this—fight."

With a sudden jerk, Don cut off the "Falcon's" air again by pulling his head farther back. Then he hissed:

"You're not poisoned, you murderer! I found the secret of the X-

ray and how it changed atoms. I tricked you and I've licked you in fair fight!"

It was a sweet moment for Millstein; for twice before, the "Falcon" had bested him in physical encounters. Don realized he must choke the killer into insensibility, at once.

The "Falcon" crashed into the cement wall and slid to the floor. In a split second, he struggled to his feet and charged Millstein, who had been quickly filling his lungs with gigantic breaths; to oxygenate his blood and to revive exhausted muscles.

This time, Don did not evade the killer's rush; he leaped in, both fists swinging viciously!

Breast to breast they stood, slugging with all their fast dissipating vigor!

Millstein, with a final, mighty effort of will power and a last call on his body, crashed his right fist on the "Falcon's" chin!

With glazed eyes the "Falcon" sank to the floor—unconscious! The "Falcon" was defeated!

Don slid to a sitting position, while his exulting heart and lungs fought madly to restore his strength. His body was a hell torment of pain and

fatigue. Even in his racking, gasping agony, Don kept an Argus eye on the limp "Falcon."

"You all right, Don?" from Cromwell in anxious tones. Jack had revived and staggered over to Millstein.

"Sure!" panted Don, "and you?"

"Just knocked out, my head hurts some; but I'm all right."

"Cosmos! Jack, I'm glad. Can you walk?"

"Sure can, Chief!"

"Fine! Go phone Bill Weston and tell him to come get the murderer. Bring Benson and Bronsky back with you. Have Benson bring morphine. We will shoot this killer full of dope. We won't take any chance of his escaping. Hurry!"


Jack hesitated and pointed to the "Falcon": "I hate to leave you with that killer, Don. He might come to and start something. Did you have a tough scrap?"

"Yes!" breathed Don from his wildly heaving bosom. Hand me that wire and pliers. I'll wire the 'Falcon' up a bit!"

"The 'Falcon', Chief? The 'Falcon'?"


"Yes, Jack, he's the 'Falcon'!"

THE END



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PROBAK JUNIOR

The Company or the Weather

By MILES J. BREUER, M.D.

This very short story from Dr. Breuer is quite characteristic and we are sure it will please our readers.

ON August 5th, two hundred farmers, who for seventeen rainless weeks had helplessly watched the hot winds searing their wilted corn, crowded perspiring in the huge barn, watching the demonstration. The long drought had driven even these hard-bitten skeptics desperate enough to listen to a cracked inventor. His apparatus was simple. A small Cushman motor, such as those used for running binders, its shaft directly connected to a dynamo-generator; an X-ray transformer coil, an Oudin spiral, and a polished chromium ball; that was all there was to it. He had it bolted together into a compact mass that was slung by a rope from the rafters, and dangled high above their heads. In one corner a boiler spouted a little cloud of steam; several electric fans blew about it.

"That," said young Kimmel, pointing to the boiler, "is not an essential part of the apparatus. We need it because we are down on the ground, in the hot winds. Five thousand feet up, there is always plenty of moisture."

He cranked the motor into a steady sputter. The Oudin coil crackled and a purple halo stood out around the spherical terminal. He swung the humming apparatus here and there over the heads of the crowd with his rope. A farmer felt a tiny drop fall on his face. Then another. A misty little shower descended on the gazing, wondering crowd in the barn, and

stopped only when the supply of steam from the boiler was used up.

"To scientists this is nothing new," Kimmel said. "It has long been known that to make rain fall, condensation-nuclei are necessary, and that these can be furnished by ionizing the air."

The spokesman for the farmers stood up.

"All in favor—" he began, but was drowned out by a roar of "ayes." Rain was needed immediately in Thayer County to prevent disaster.

The farmers promptly raised the ten thousand dollars, and by four o'clock in the afternoon on August 6th, Kimmel had two airplanes with Oudin discharge generators cruising about over the county. Twilight fell early on the farms, countless faces were turned to the sky to catch the first drop of rain. Slowly a drizzle began, which turned into a steady rain. It rained all night; the next day there were two or three rainless hours, but the following night the rain continued steadily. Barnyards were a mass of muddy slush, roads were impassable, but the farmers were happy. The corn, the farmer's hope and life, again raised its green and buoyant heads.

Two days later an attorney visited Kimmel and the Secretary of the *Farmer's Union*. The newspapers announced the most sensational lawsuit ever heard in the West. *The Jingling Brothers' Mammoth Circuses* was su-

ing Harvey Kimmel and the *Thayer County Farmers' Union* for a quarter of a million dollars to cover the loss of traveling expenses, maintenance, and two days' admission receipts, because the deliberate and intentional efforts of the latter had directly produced and resulted in such heavy rains as to make a trip to and two days' stay at Fairbury a total loss to the circus. The loss was due solely and entirely to the rain-making machine of the defendants.

The defendants were forced to admit the facts of the case; these were too readily proved. But they urged that the loss of a crop and financial ruin had stared the community in the face, and they had resorted to desperate measures to save themselves. The plaintiff urged that they had no legal right to bring financial ruin on the circus; and if they had waited two days, they could have saved their crop without harm to the circus.

The judge was puzzled when he gave his instructions to the jury: "We have no precedents on which to base a decision for this case, because no individual has ever before been able to influence the weather. The gist of the question before us is: Can an individual or a group of individuals

be permitted to tamper with conditions that seriously affect the entire community?" The jury, from which the plaintiff's lawyer had rigorously excluded all persons interested in agriculture, were just about convinced that it was too bad, but that the circus lawyer was technically correct. Technically, the farmers were directly and unavoidably responsible for the damages to the business of the circus. Ruin, worse than they had imagined before, loomed up before Kimmel and the *Farmers' Union*.

Suddenly outdoors a motorcycle popped, and a messenger in khaki burst in and handed a yellowish-gray card to the lawyer for the defense. "You almost got here too late," the latter said to the messenger, and then added, under his breath to himself: "There is nothing like being thorough." He moved to admit new evidence, which was allowed.

"*United States Weather Bureau Forecast*," he read. "*August 5th: heavy continuous rains tomorrow and the next day in Thayer County and vicinity.*"

The judge rapped with his gavel to a silent courtroom.

"The case is dismissed," he said. "Bailliff, close the court."

THE END

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“By Jove!”

By WALTER ROSE, L.D.S., R.C.S.

As this story ends, it increases in the variety of adventures and problems to be solved by the characters of the story, who are supposed to be able scientists as compared with the Graks.

CONCLUSION

CHAPTER XIV

A GRIM FIGHT

ON the shore of a little bay thus revealed, we came across the carcass of some huge animal around which a host of strange and horribly active creatures were gathered, tearing at the flesh and at one another with a savagery that bespoke a ravenous hunger. Each of these creatures had nine legs set all round the under edge of a large flat circular body giving the whole a grotesque resemblance to a multi-legged table about four feet high and five in diameter. From just above every third leg sprouted out a six-foot-long flexible limb ending in a sharp hooked claw that was divided into three at its tip. From the centre of the back, which was covered with a single sheet of hard armour, a shorter, slightly flexible stalk appeared, expanded at the end into a large, bulbous, deep pink eye.

A singularly horrible point about these monsters, which were of a dirty white colour, was that they did not advance in an orthodox fashion, but spun along by rapid revolutions of the whole body, bringing each of the claws into operation in succession. Scraps of flesh which the clawed limbs rent from the carcass, they car-

ried between the legs to the underside of the body, where as we afterwards discovered, a gaping mouth was situated.

We started back hastily, but we were too late, for we had been seen and immediately a dozen of the brutes on the outskirts of the savage throng started revolving towards us at a terrifyingly rapid pace. We turned and fled, the Graks not far behind us despite the fact that they were walking backwards, for these devoted warriors were prevented by ingrained tradition and instinct from turning backs on any foe even to fight from a better point of vantage. Near at hand, reared up against the cliff-wall, was a large steep-sided rock which alone offered any hope of refuge.

To the top of this we leaped, snatching up to our sides such of the Graks as we could reach before the whirling horde was upon us. Six of the soldiers we succeeded in saving thus. Two others and also the little labourer were overpowered and slain before we could succour them. The latter being quite defenseless, was torn to pieces in a trice, but the soldiers fought stubbornly back to back, until they literally disappeared beneath the combined mass of their opponents. Higher and higher piled the struggling heap as others arrived on the scene and those that had commenced to assail us joined in the struggle for



One deafening roar then another and a fan of legs, eyes, tentacles and shattered bodies flew into the air, whilst many hundreds more of the creatures were killed by the shock.

the prey within reach. Suddenly as if by magic, the whole writhing mass subsided and lay still. We stared in amazement, then Plant laughed.

"HCN (hydrocyanic acid) does not appear to agree with these brutes any better than it did with the Krugs. Unprepared as we were, it is just as well that it was not one of the fulminate bombs that got broken. I wonder will any more of them come, or will they finish up that dead thing first."

The question was not long left unanswered, for although no more came from around the buttress, others commenced to emerge from the waters of the lake, first in twos or threes, then in tens and twenties, and then in hundreds, even in thousands. Up the shore they spun towards the great heap of slain, then, on nearing it themselves, collapsed in death, until beyond the first mound a piled up circle of these strange creatures lay dead.

After a time, however, the poison gas, from its gradual dissipation into the air, its absorption by the earth and the damp bodies, began to lose its potency and the advance of the rotarians, as we called them, recommenced.

FOR a time they contented themselves with dragging away and tearing to pieces the bodies of their comrades, many dying from the effects of the poison on their surfaces as they did so, but great as was the number of the slain they did not sufficiently satisfy the ravenous appetites of the whitish hordes that continued to emerge from the water in endless succession. Soon nearly all the dead had been devoured or dragged down into the water and now again the horrid crew turned its attention to us. The top of the rock

on which we stood was about eight feet above the beach and some twelve feet in diameter. At one side the cliff wall rose sheer. Plant and I defended the front with three Graks on either side. The rotarians' twirling gait was more suited for progress on the level than for climbing steep rocks for which their mode of life offered little need. None the less, they were able to scramble up to our level in sufficient numbers to keep us fully occupied smashing them back with our clubs.

"Strike at their eyes," I cried, sending out at the same time a strong thought message to our six allies.

These tactics gave us quick advantage. As fast as they advanced, Plant and I crushed down their bulbous optics and the Graks snapped through the supporting stalks, much as a gardener snips a projecting twig from a hedge. Blinded, they twirled helplessly back through the ranks of their attacking comrades, slashing and tearing at all within reach until the beach was the site of twenty desperate internecine combats and the force of the surging attack was temporarily stayed.

"Now's the time," called out Plant and seizing a couple of bombs from the rucksacks, he threw first one and then the other as far down the sloping beach as he could. One deafening roar then another and a fan of legs, eyes, tentacles and shattered bodies blew into the air, whilst many hundreds more of the creatures were killed by the shock.

As the echoing crash of this double explosion went reverberating away across the great cavern until it died away rumbling in the distance, Plant with true scientific prevision took out his watch and waited. The rumbling continued for a while, then got louder

till back against the rock wall above us was hurled the returning echo of the double crash.

Plant put his watch away. "Just two and a half minutes. Allowing that sound travels at 1100 feet a second that will make the opposite wall about fifteen miles away. So either this lake is profoundly deep, or only a part of its surface is exposed to the air, or most of the water from the great crater must have flowed away elsewhere."

Subsequent calculations proved the second hypothesis to be more nearly the correct one.

This final blow effectively checked the advance of the rotarians, for though a few emerged from the water from time to time and slyly filched a body from the shore, no further attack was made on us. At the foot of our rock lay a cluster of mangled corpses. A few yards away, where the first heap of poisoned dead had lain, the great heads, that alone remained of our slaughtered allies, had been laid bare, whilst the whole shore to the water's edge and for a hundred yards on either side was thickly strewn with rotarian débris. Civilized warfare had won yet another victory.

For a full hour we remained on our refuge, whilst the echo went back and forth, tossed to and fro from the walls of the closed space till it gradually grumbled itself into silence. Meanwhile most of the dead and the fragments on the beach had been removed one by one to the water by a succession of rotarians who appeared to have been completely cowed by the explosions. We took advantage of this to have a meal and to feed the Graks, a duty that, owing to the death of the little worker, now devolved upon us.

For another hour we waited, then seeing no movement of overt hostility from the water, we jumped down from the rock and set off at our best pace along the shore.

Luckily the fright at the unaccustomed noise appeared to have spread to the party that had been devouring the carcass, for the shore of the little bay was deserted. There was not enough left of the great beast, whatever it was, to enable us to form any idea of what its appearance had been during life, but it must have weighed at least a couple of tons (earth-weight) and had a mouth that bore a rough resemblance to the beak of a parrot. However, we did not waste any time in examination, but kept along the beach and over occasional patches of rocks at the fastest pace we could maintain.

AFTER several hours of this progress, that luckily was quite uneventful, except that from time to time we saw in the clear water from the rocks more of the strange creatures of the underworld. For some time we had been on the lookout for a safe point of vantage where we could spend the night and that could easily be defended did occasion arise. Such a place we at length found in a steep almost overhanging rock, the flat top of which was at least fifteen feet above the clear water and could be reached only by creatures endowed with springing powers equal to our own. Plant first of all leaped up and pronounced the place suitable for our purpose, there being even a narrow-mouthed cave in the abutting cliff-wall. I then lifted up the Graks one by one as high as I could stretch, whilst Plant, having removed his coat, dangled it by one sleeve for them to clutch with their clawed hands. I

then easily enough leaped up beside them.

We discovered that the little cave widened out sufficiently to contain our whole party, did the need arise and was continued back into the cliff by a narrow crevice. We decided to remain in the more open air, however, as long as no urgent danger threatened.

Whilst we were eating our evening meal, we took stock of the contents of our rucksacks, our main anxiety being concerning food. Luckily this fungus cake diet is extremely light, and bulk for bulk, far more satisfying than would have been say bread or tinned meat. We therefore still had ample provisions for our homeward journey.

This we decided to commence the next day, for we could see through the glasses that we were now approaching a place where the water was bounded by the overhanging rock-roof, which of course made further progress impossible. Of warlike stores we had seven fulminate bombs, having recovered the contents of our slaughtered allies' rucksacks, eight vessels of HCN and two of corrosive sublimate in addition to our well-tried clubs. Also my rucksack contained the great purple stone, in itself a useful weapon in an emergency.

Having eaten, we sat watching some of the curious denizens of the lake in the clear water below us. Several of these bore a distinct likeness, or at any rate a distinct biological analogy, to creatures that I had observed on earth in fresh water pools and by the side of the sea at low tide. For instance one bright yellow chap about four feet in height resembled nothing so much as a little tower, on the summit of which what appeared to be two wheels, whirled in opposite

directions, in such a way as to drive a continual current of water, together with the smaller creatures swimming in it, into the interior of the creature, where no doubt they were held and digested.

Not far from it stood a bright red animal that might claim fifty-second cousinship to a sea-anemone, though he had his own distinctive characteristics. His body, no thicker than my arm, rose slim and graceful from the rock to which his base was anchored. Four feet from the ground it branched out into seven thin tentacles that spread out stiff all around him like the petals of a flower. Innocent these looked, but that appearances are often deceptive was discovered by a fish-shrimp thing of a larger type that touched against one of them.

Instantly the rigid array sprang into active life and in a trice the unfortunate victim was hopelessly enclosed in a seven-armed embrace from which escape was impossible. In a few moments it was forced towards the bifurcating point of the tentacles and pressed into the mouth that stretched open to receive it. A few moments more and the fish-shrimp was merely a bulge in the centre of the slim body and the seven petals were again spread out as innocent-seeming as before.

For some time it remained thus, then becoming for some reason dissatisfied with its environment, it proceeded to bring its seven tentacles together, bent over till their massed points touched the ground and took hold a few feet away, then calmly detached its base and with a looping of its body brought it up alongside the tips of its tentacles. Several repetitions of this process took it out of our sight.

Shortly afterwards the orange-

coloured windmill animal also decided on a change of scene and having likewise detached its base shot away like a submarine, a resemblance considerably enhanced by the manner in which its rapidly revolving wheels drove it through the water like a couple of propellers.

"By Jove," said Plant, imitating my favourite expression, "the creatures of this place make a specialty of unusual methods of progression."

"Yes, they do, don't they?" I agreed. "But still it is more than likely that a naturalist fully conversant with the habits of some of the less conspicuous of terrestrial animals would be able to point out many interesting parallels between what we have seen and earthly forms. For example I remember when I was at Durban I saw . . ."

"Well, I think it is about time to turn in," interrupted my companion, following his usual habit when I showed signs of becoming discursive. "The Graks will keep watch. Good night."

I threw him a glance of injured dignity, but he was already sound asleep, his visor lifted and his head resting on his rucksack. In a few minutes I had joined him in the dreamless sleep our Spartan diet always insured.

CHAPTER XV

"DOWN AND OUT"

I WOKE to a vague realization that all was not as it should be. Pulling down my visor I looked up. Something was wrong. What was it? I looked at my watch. Half past eight, we had certainly slept late in the unaccustomed dark. The Graks squatted quietly in the same places and Plant was still sound asleep, yet something had happened.

Then as the mists of sleep left my brain I realized what it was. The water that had been fifteen feet below us when we went to sleep now lapped at the very edge of the platform on which we lay. The beach along which we had come had entirely disappeared and we were hopelessly isolated on our narrow rocky perch, a sheer wall behind us and the rising waters filled with unknown perils at our feet.

Hurriedly I woke Plant, who was not long in taking in the situation.

"Now that is decidedly interesting," he remarked, the scientist ever uppermost. "I ought to have suspected that such a thing would happen."

"But what *has* happened?" I cried rather impatiently.

"Why the tide has come in of course," was the calm answer. "Obviously such a huge mass as Jupiter must exert an enormous attraction on any large body of water as near to him as we are. Were Ganymede absolutely constant in his opposition to Jupiter a constant pull would be maintained and no effect would be discernible, but that six degree oscillation, I have spoken to you about, just makes all the difference."

"A difference of life and death to us," I exclaimed, "if the tide continues to rise as it appears to be doing." For now the water was flowing over the platform on which we stood and we had to seek refuge in the cave.

"Let us try how far the crevice extends," I said, "it is the only alternative to being drowned like rats in a trap."

The crevice was so narrow that it was only with difficulty that I was able to wriggle through, but after a few feet it widened out and I was

able to crawl along in a half crouching attitude.

"Come along," I called out. "You will not be able to bring the rucksacks, but fill your pockets with food. From the look of it the crevice continues for some distance. Anyhow it is our only chance."

Soon the others were beside me.

"Here, Ronald, take these," thrusting into my hand the binoculars and a handful of food. "I have the compass and the altimeter. I could not bring anything else."

With a flash of regret for the great purple diamond and incidentally for our trusty clubs, I led the way along the passage. To our dismay we found that almost immediately we came to a yawning pit that descended almost sheer for nearly a hundred feet. We stopped aghast, gazing across this chasm at the blank wall opposite. We appeared in worse case than ever.

"It seems a desperate chance," I cried "but we have no alternative. It may ascend again later."

Already the water had followed us along the passage and was commencing to trickle over the edge of the pit. In utter desperation, we commenced the precarious descent which seemed to offer such slender hopes of escape, as an alternative to standing where we were until the intruding stream swept us bodily downwards.

Before we reached the bottom, where the passage again took a nearly level course, the water was descending on our heads in a miniature cascade. Along the passage we ran full speed—luckily the Graks did not insist on retiring backwards before this utterly novel danger—the stream swirling round our ankles. Soon it was up to our knees, then to our thighs and the end seemed close at hand.

Desperately we staggered on, determined to struggle to the last. Then for a while the deepening stream widened somewhat and we found ourselves in a large open chamber which on one side of the stream sloped upwards some thirty feet or more.

"Up here," I gasped. "There is just a chance that the water won't reach this high."

Up we scrambled and only just in time, for even in its widened bed the stream was rising rapidly. Soon we were crouched at the very summit of the slope whilst a bare thirty feet below us the raging tide boiled and swirled as it escaped into the farther passage now filled roof high.

Would the water reach us where we sat? It seemed a case of touch and go.

Steadily foot by foot rose the hungry waters. Soon they were but twenty feet from us, ten minutes later only fifteen, then ten. I looked up.

Plant imperturbable scientist that he was, was studying his watch and making a few calculations in his pocket book.

"Working out the premium an insurance company would charge on a whole life policy?" I asked sarcastically.

"Well, yes, in a way," he replied. "I have just worked out that if we can survive for another twenty eight minutes—perhaps somewhat less—we will be safe. It all depends on whether the passage beyond us is sufficiently large to carry off the water quickly enough to prevent our being drowned earlier."

"How do you make that out?" I asked, anxious to know how well-founded was our slight hope of escape.

"Simply enough, I have found that the Ganymede makes four complete

oscillations during each round of his orbit or in other words during 171 hours 44 minutes. This means, the tides being dependent on the oscillations, that the time between each high tide is 42 hours 56 minutes, or from lowest to highest tide almost precisely 21 hours 28 minutes. Now it was five minutes past twelve when we arrived in the cavern. At that time the tide was either dead out or was just starting to come in. Had it been still ebbing I would have noticed the thin line of wet rock at the water's edge when we were drinking and washing. It is now 9.15, so dead high water will be eighteen minutes hence at the outside."

DURING this explanation I had been watching the water that now swirled a scant three feet below us. Slowly it continued to rise. Another foot it climbed during the next ten minutes. Thirteen minutes or somewhat less till high tide if Plant's calculations were correct and after that it must be some time before the rush of water from the great cavern was in any degree abated. Actually our lives depended on the unknown length of time that the tide had turned before our arrival in the great cavern.

Still the water continued to rise and now, although we were crouched back as far as was possible, the hungry waters swirled within fifteen inches of our feet. Now twelve, ten, eight, six. Soon it touched our very toes and the end seemed near. Then as if sure of its prey it halted in its upward climb.

Plant gave a short laugh. "I was waiting for that," he said. "It won't rise any more."

"How do you know?" I asked anxiously.

"The air at the top of this chamber has reached its limit of compression under the present conditions. The time of full tide is reached if not passed now, so that pressure will not be increased. We have merely to wait patiently till the water recedes from the mouth of the cave and the passage empties itself, before we continue our interrupted journey. That is if we decide to proceed."

"I suppose we had better continue. The water must have an outlet and by your calculations we will have some 43 hours to get clear of the passage before the next high tide. Meanwhile, how about a little food? It is a bit damp I am afraid."

After we had eaten some of the somewhat soggy cakes, we fed the six Graks, who had been undergoing this ordeal with their usual impassivity. It is possible that by this time they had come to rely on us to get them out of all their difficulties and dangers. Poor creatures, if that were the case, I am afraid that their trusting confidence was destined to receive a rude shock.

For half an hour the flood lapped at our feet as we crouched huddled up in the very acme of discomfort. Cramped by our constrained position, wet through, utterly exhausted by our late strenuous efforts and mental stress, bathed in perspiration and gasping from the atmospheric pressure, it is little wonder that, the high tension relaxed, we sat in gloomy silence waiting for the waters to subside.

This they did slowly as if reluctant to leave the prey so nearly within their grasp. At last however we could stretch out our stiffening legs and stand erect. Gradually the suffocating air pressure relaxed, until finally a strident, sucking noise heralded the uncovering of the roof of the entrance

and the admission of fresh air. Another half hour, and all that remained of the boiling torrent was a thin trickle of water flowing across the floor of our cave and away through the exit tunnel that we could now see was barely three feet in diameter.

Our lives were saved and a precarious way of escape was opened, presumably in either direction, but we were in a sorry plight. True, we still had the compass, altimeter and binoculars, but of our food only a few damp crumbs remained. Our clubs, our rucksacks with our water bottles and defensive weapons, and incidentally the big purple diamond, had been swept away, leaving us in the bowels of the mountain, provisionless, and weaponless except for our pocket knives. Facing us were the equally uninviting prospects either of undertaking the three-day journey back, for the most part without water, and again running the gauntlet of the hordes of the rotarians, or of continuing to plunge deeper into the heart of the mountain along a passage of doubtful size whose ultimate conclusion might well be in some awful abode of unknown monsters, or in a bottomless chasm whence any attempts to return would be hopeless. Could a couple of utterly defenceless mortals be faced with a choice of two more dread alternatives?

"Come on, Ronald," cried Plant with a brave affectation of cheerfulness. "Whilst there is life there is hope. We are not finished till we are down and out. Down we certainly are, so the sooner we get up the better. According to my calculations, if this passage widens out again and keeps reasonably straight and does not descend too much, we will be only about eighteen to twenty-five miles from the open air and I hope not an in-

superable distance from our encampment."

There were a disconcerting number of "ifs" expressed or implied in his summary, but certainly there was no use in sitting still; so pulling myself together, I took the lead and in single file we started to creep along the constricted part of the tunnel. Mercifully this continued for but a few yards, an ancient fall of rock was probably originally responsible for it, and the passage soon enlarged to dimensions that permitted us to walk erect. We were thankful also that the water-smooth surface and gentle slope made reasonably rapid progress possible.

FOR several hours we kept on, feeling that our most serious danger was now from famine. Water we were able to obtain, as we required it, from the numerous puddles and we drank deeply to stay the pangs of hunger. Plant, who had the compass, reported that we were still travelling almost due south, the direction in which he considered lay our best hope of safety. At times our course was along the level, at others downhill and twice we encountered places where a slight rise had retained the water, compelling us to wade for several hundred yards waist-deep. In one such place we found it necessary to carry the Graks, making three double journeys, for the water rose to a height that would have drowned them by entering the breathing holes along their sides.

For the most part the tunnel was of a uniform size, but several times we passed through large caves such as the one to which we owed our lives. It was in one of these chambers, that, having travelled at least ten miles, we halted utterly exhausted by stress and fatigue. Despite the discomfort

of our condition, to which were now added the pangs of hunger that draughts of water could but little assuage, our weariness was such that a few minutes after stretching our tired limbs and raising our visors we were both lost in the deep coma of complete exhaustion.

Still but partly refreshed by our hours of trance-like sleep and tormented by the hunger that water now did nothing to mitigate, we rose and continued our painful journey. Even the impassive Graks showed signs of distress as hour after hour we staggered on. We knew that unless we came to daylight and to food ere long, we were sure to perish miserably and leave our bones in this gloomy tunnel in the depths of a mountain six hundred million miles from our native land; unless indeed the next tidal flood washed our stiffened bodies deservingly forth to the daylight we had struggled so long and painfully to reach.

"What do you think of our chances now, Plant?" I asked more to relieve the death-like silence than with a desire for information.

"Two live men, to say nothing of six Graks, are worth a regiment of dead of either species any day," he replied. "We are still travelling south and according to the altimeter are at least four hundred feet above the level of the plain, so unless this passage ends in some impassable gulf, it is only a question of keeping on till we reach daylight or drop by the way."

"Let us hope that when we do reach the outer world it will not be just to starve to death. Though it will be better to die in the daylight than in this place," was the most cheerful comment I could manage.

"It may be that the intermittent water supply will have promoted

some vegetable growth that will supply us with food. In any case as soon as we know our position we can telepath to our waiting Crarn to come at once with food, if the distance be not prohibitive."

As is usually the case, Plant's calculations were correct and, though our weakness compelled us to make two long halts, we saw at length in front of us a bright star that enlarged as we approached it into a cave-mouth, and through which we emerged to find ourselves looking down on the level plain about two hundred feet below us, bathed in the silvery light of Jupiter and of two of his attendant moons. From where we stood, a deep water course had been ploughed down the hillside and out into the plain, which here was not uniform saffron desert but glowed with deep red of vegetation along its course and for a full square mile around the lake to which the stream-bed led.

"**B**EHOLD," I cried, "the first surface water on Ganymede on which the eye of man has rested.

"To say nothing of the first patch of surface vegetation. Let us hope that it contains something edible for human beings. To be on the safe side we had better send out our S.O.S. from this elevated point, before testing the very doubtful edibility of that dark red stuff."

The compass showed that we were looking out due south. Towards the east and the west, the steep mountain sides extended. On the west they disappeared about twenty miles distant, behind a projecting buttress that was continued for about a mile out over the plain as a saddle-back ridge. That to the east was paralleled by a line of trees that seemed to mark the line

of the water-course which appeared to bear off sharply to our left from the far end of the lake.

Having taken our bearings and roughly worked out our position on a page of his notebook, which his leather coat had kept fairly dry, we turned to the west, closed our eyes the better to concentrate, and spent five minutes in sending thought waves in the direction of our encampment, which we judged to be about eighty miles distant.

"Come speedily to help the Travelers at foot of mountain, three days toward the new sun. Come speedily. Bring food, we have water." Again and again we repeated this message.

At last, faintly at first, then more decisively came the answer.

"We hear, Travellers, and are coming with food."

One more message we sent as a precaution for we did not know what danger might await below us.

"We hear, bring also the Krug-death and the roaring noise and use caution when approaching the water." The thoughts or "creaks" denoting Krug and death are the Grakan terms for poison bombs. Similarly roaring noise signified those charged with fulminate of mercury.

CHAPTER XVI

THE OASIS

HAVING done all we could to provide for our future safety, our only problem was to find some means of keeping alive until help arrived. Naturally neither we nor the Graks had any experience as to the edibility of Ganymedan vegetation, so we would have to take chances. The discovery of any animal feeding in the oasis would however be a limited,

though by no means an infallible, guide.

A careful scrutiny of the red area through the binoculars did not reveal to us anything distinctive, for though I thought I detected signs of movement I could not be certain. The descent was easy and a few minutes found us in the vegetated area.

On close approach we found that what had appeared to be bushes were more of the nature of trees. I use both these terms in their relative sense, for these growths bore no resemblance to either bushes or trees as we generally use the words. In fact in many cases I doubt whether a skilled botanist would admit their vegetable nature at all. For the most part the stems were smooth and proportionately thick. The leaves, that jutted out at all sorts of unexpected angles, were shining and rubbery-looking. Imagine a smooth prickly-pear, deep red in colour, that was undecided whether to imitate a cluster of sea-wrack or a bunch of stags-horn coral, made of india rubber and bearing clusters of green berries, and you will have a better idea of these curious plants than I can otherwise convey.

A few seemed frankly to desire to be animals, for on our approach a small clump of smaller growths of a brighter red suddenly lowered their branches to the ground, pulled out their roots and scuttled away like so many spiders for about twenty yards. Here they again lowered their roots, which wriggled their way into the soft earth. In a few minutes these Ganymedan prototypes of Birnam Woods were standing with branches extended as before, leaving only an area of ground marked by irregular holes as evidence that the whole thing was not a figment of our over-tired brains.

It was not until we had penetrated

some distance into this fantastic labyrinth that we came across anything that was definitely an animal according to our ideas of the term. Crawling over the red-hued limbs of one of these rubbery plants and nibbling at the green berries, we came across several creatures, more like five-foot blue sausages on short legs than anything else. Suckers on these legs allowed them to walk upside down as easily as right side up.

"Well anyhow the berries seem to agree with these things," I said, "so maybe they will agree with us. I know that I am hungry enough to risk it."

I had just reached out my hand to pluck one of the bunches, when a curious vibrant, whirring sound approaching from my left caused me to step back and stand rigidly erect. Next moment there alighted by the side of the sausage animals the first winged creature I had seen on Ganymede except for the Grakan neophytes.

About four feet nine inches in length and of a bright yellow colour, this curious creature had a pair of flying organs, wings if you will, each at least five-and-a-half feet in length and of a most unusual shape. Straight and bare they projected from either side of the body for a length of four feet and then widened out into an oval disc eighteen inches long and fringed round the edge with hundreds of long bristles.

The legs were thin, jointed and each nearly five feet in length. The head was large and was furnished with a pair of six-foot feelers and two big multi-faceted eyes. The body was divided into two portions by a long waist that enabled the rear end, that was terminated in a sharp point, to be doubled forwards.

This miniature dragon, after a glance at the crawling blue sausages,

walked over to one of them and, selecting a point on its side, deliberately thrust into it the sharp point of its rear end. Withdrawing it, it thrust it in a few inches farther up the body, performing the operation in all eight times on either side of the body of its victim. It then started vibrating its curious wings and flew away, whirring like an aeroplane.

"Whatever was it doing?" asked Plant.

"It seemed as if it was laying its eggs in that blue sausage," I answered. "See, all the others have punctures down their sides, showing that they have been treated in a similar manner."

"I see, and when the eggs hatch, the grubs or whatever they hatch into, live on the body of the victim. What a positively terrible idea."

"Oh well," I rejoined. "Nature knows her own business best I suppose. Maybe these creatures do not suffer as much discomfort as we would under similar circumstances."

"UGH," grunted Plant. "Luckily our fungus diet does not induce dreams, or I swear that I would dream of that flying yellow horror laying her eggs in my back. Come on, let's get away from here." Plucking a few bunches of the fruit, I followed him and sat down underneath a large tree of a different type a few yards away with my companion by my side and the six Graks crouching in a semicircle to the outer side of us. Cautiously I tasted one of the berries. It was sweet and strangely refreshing. I took a larger portion. Yes, it was much like a ripe nectarine. I finished it and felt much invigorated.

"They taste jolly good, anyhow," I said, handing Plant a few and eating another myself.

After we had eaten about six each, we fed the Graks who had been waiting patiently but obviously hungrily. We then had another half dozen all round and felt a warm glow spreading through our empty stomachs and jaded brains. Certainly this green fruit had remarkable properties. There ensued the most amazing circumstances.

Now if this were some purely fictitious romance, designed to pass away an idle hour, I would here relate how the tree under which we sat suddenly stretched down great sucking jaws which endeavoured to drag us into their midst and then drain our life's blood. I would proceed to relate how we painfully hacked ourselves free by the frantic use of our penknives and staggered fainting just beyond the reach of their lethal branches.

This however being a simple narrative of fact, I am compelled to admit that, bizarre and unearthly as the tree was in appearance, it did none of these exciting things. In fact as far as I could see it did nothing at all.

What did happen was that, when feeling ourselves sufficiently refreshed, we desired to rise to our feet to explore further, we found ourselves unable to move hand or foot. Indeed we could not so much as turn our heads, close our eyes, or speak a word. Evidently the green fruit, refreshing as it was, contained some powerful muscle-paralysing agent. That it was only the voluntary muscles that were affected was evidenced by the fact that we were still alive, for paralysis of the muscles of respiration or circulation would naturally have been almost instantly fatal. I had been looking away from the tree trunk towards my seven companions when I became thus rigid and so I remained staring at them with the fixed, immobile eyes of a serpent. How long would this catalytic condi-

tion continue, I wondered, deeply interested rather than perturbed by the novel experience. Probably until the usual digestive and metabolic changes had removed the active principle from the blood stream, maybe three or four hours, possibly as many days.

If only I had been lying in a comfortable position with my eyes closed, the idea even of a three day's rest would have been endurable, as we might have to wait over that period for our Grak allies to relieve us. I certainly did not relish the idea of sitting bolt upright, with my eyes fixed wide open, for such a length of time.

I only hoped that there were in our vicinity no predatory animals, to whom in our present condition we would fall an easy prey. So far we had only seen the long blue sausages and the yellow flier, but there might be other creatures amongst the trees, or in the waters of the lake.

I began to calculate how long it might be before we could expect succour. Not much less than two days at the best. Anyhow, there was nothing else to do but to make the best of things and endure the discomfort as best we might. At this stage I thought only of the discomfort, having no vaguest conception of the ghastly horrors the succeeding hours were to bring.

Even when, about six hours after it had disappeared, I again heard the shrill whirring sound of the approaching yellow flier, I was more disposed to welcome it as a slight relief from the monotony of inaction than to regard it in any way in the light of a danger. I was soon to be grievously disillusioned.

First she alighted on the same tree as before and carefully inspected one by one all the long blue creatures feeding thereon. Finding them all already

the repositories of eggs, she spread her wings and commenced to fly around and around in ever widening circles. Twice she passed close above us, then paused, passed on, to return again with a long gliding swoop that landed her on the ground within a few yards of us.

Her next movements were slow and deliberate. Fixing her multiple eyes on us, she commenced slowly to walk in our direction. As we were seated with the Graks on the outside, she reached one of these first. Hesitating, she gently touched him all over with her long feelers, then as if satisfied, she advanced a step nearer, then another till she was right beside him.

What happened then sent such a thrill of utter horror through my body that, paralysed as I was, I seemed to shudder all over. Deliberately and marking her place with the utmost care, she drove her sharp ovipositor into his body between the joints of his armour and into the unprotected part of the abdomen eight times on each side. Whether the poor chap felt the stab or not I was unable at that time to say. I know now that he did not. But whether he felt the pain or not he had perforce to remain motionless. Then, as if satisfied, the great yellow creature spread her grotesque wings, whirled aloft once more and disappeared.

As nearly as I could judge in our present helpless condition, when time had no measurement in terms of movement, it was another six hours before I again heard the now dreadful-sounding, whirring hum circling over us. This time the yellow horror's approach was made with great confidence, showing that some faculty of memory dwelt behind those many-lensed eyes. The Grak next in the line was the victim she selected, and the double row of

punctures were inflicted with the same careful precision.

THERE will be little benefit in my making any effort to harrow the feelings of the sensitive reader by a recountal of the almost incredible mental torture of the ensuing twenty-four hours, during which at regular intervals the rest of our bodyguard became the living repositories of this awful creature's eggs.

It was about an hour after our second Grak had been attacked, that I heard the sound of running water and, though I could not see the stream-bed, I knew that it was again filled by the tidal overflow from the great subterranean lake. For about two hours the sound continued then gradually lessened and finally ceased. Mercifully however the action of the drug saved us from the added torment of thirst.

At last but one six-hour interval remained before either my friend or myself was doomed to the same repulsive fate. Our only chances of safety were, either that the effects of the strange drug wore off in time, or that our allies arrived before the worst happened. We had absorbed a very heavy dose of the drug and, though we were beginning to feel a slight tingling sensation throughout our limbs, we were still as hopelessly immobile as so many bronze statues.

Ever since the acute realisation of our danger, I, and Plant also, as he told me later, had been sending out continual messages.

"Hurry, hurry. Krug, krug, krug."

From time to time the answer came back.

"We are coming without stopping."

"We are coming rapidly, we have left the rolling thing (the cart)."

How far they had yet to travel neither they nor we could tell, except

that the thought-waves came to us with increasing strength. Meanwhile at least two hours had elapsed of the six that had separated one of us from a fate too terrible to contemplate. Then came the stirring message.

"We are on a hill, we see water about one food deposit distant." We took this to mean twenty miles as some idea of this distance would have been impressed on them during our outward journey.

And so the hours passed until the sound of the yellow monster's droning return was mingled with the message.

"We have reached the first of the strange creatures that rise from the ground," and with our frantic reply, "Hurry, hurry, hurry, krug coming, kill, kill."

Now it is a race for life between our allies and our terrible enemy with the slight advantage that the former realised the need for haste. The tingling in my limbs became more pronounced and I found that with an effort I could twitch my fingers.

In front of us now had alighted the flying terror which was eyeing us intently. Our appearance being so different from that of the Graks, she repeated her former cautious approach, whilst I gazed hard into her many-faceted eyes and strove by sheer will power to hold her back, at the same time making frantic efforts to move my hands. The action of the strange drug was undoubtedly passing for now I could bend my wrist.

Then the long feelers touched my face and the brute sidled nearer. Stronger came the messages of approaching succour and more desperate grew my efforts to break myself free from my state of drugged catalepsy.

Then at the moment our allies ap-

peared from amongst the trees, the deadly probe was lifted to my side. A mighty effort born of panic and I seized it with one hand and clung to it desperately, calling with a cracked, unnatural voice. "Krug, krug, kill, kill." As I felt the smooth ovipositor being dragged from my grasp, the strain proved too much for me and I passed into a state of complete oblivion.

My first sensation on my return to consciousness was that water was being sprinkled on my face and poured between my lips. I gulped down a mouthful gratefully and then opened my eyes. Plant was bending over me a look of strained anxiety on his bearded face. In a semicircle stood the rescuing party, the Crarn slightly in advance of them. Near at hand in a cluster were our six Graks whilst at their feet lay the severed halves of the flying terror.

"Saved by seconds, old man," cried Plant seizing my hand whilst the tears of emotion started to his eyes. "For one awful moment I thought that abysmal brute had served you as it served those other poor chaps."

"Is there no hope for them?" I asked, as with his assistance I rose to my feet.

"Come and see," he answered and led me to the tree where the blue sausage animals had been feeding. A few were still devouring the berries as before but several now lay dead and shrunken, their flanks displaying gaping holes; whilst, on adjoining "leaves," hung dozens of yellow bags of a deep yellow silky material reminding one of silkworm cocoons the size of footballs. Even as we watched the sides of one of the blue victims were burst open and there issued a gruesome clutch of great whitish maggots, which at once commenced to weave themselves similar silk coverings.

With a gasp of horror I looked straight into my friend's eyes asking a mute question. He nodded.

Sorrowfully we returned to the others, where Plant selected a HCN (hydrocyanic acid) bomb and signing to our six to accompany him went away downwind amongst the vegetation.

In a few minutes he returned alone. Neither of us spoke. Alien in form and ideas as they were, the poor victims had been stout allies in time of need and their tragic fate cast a distinct gloom over our spirits.

CHAPTER XVII

PLANS AND EXPLORATIONS

FOR several days we rested and recuperated after the terrible ordeal we had undergone. Part of this period we devoted to a systematic destruction of every one of the long blue sausage animals we could find and also of all the silken covered grubs. The yellow fliers were numerous in other parts of the oasis, but it was seldom that one of these came within our reach. We hoped however by the methods we adopted to lessen their numbers and eventually to exterminate them.

Also by cautious experiment we had found several trees that produced fruits which could be eaten without ill effect and were glad thus to amplify our other diet. A party had been sent back to bring up the cart, for we had only enough of the fungus cakes for a limited period.

After some discussion with me and with the Crarn, during which he outlined the scheme he had evolved, Plant decided that a message must be sent to Grakok calling for large bodies of labourers with the necessary body-guard and also for ample supplies of

food and explosives. This message the Crarn sent out and shortly afterwards we received the news that a strong expedition was on its way.

Plant's scheme was one of impressive and ambitious magnitude, being nothing less than, by leading a continual stream of water from the great lake to the plains round Grakok, to reestablish the rainfall of the planet on something approaching its former scale. His plan was magnificent in its very simplicity.

"According to my idea," he explained, "that great reservoir contains practically the whole of Ganymede's store of water drained thither some thousands of years ago from the crater above. The amount, that has flowed off since, is comparatively trifling, as both the first crevice and the exit from the chamber, where we were so nearly drowned, have probably only gradually attained their present still limited dimensions. Also most of the water that has escaped may well have been brought back by an occasional entirely local rainfall.

"All we have to do therefore is to blast away the rock on which we slept and the adjacent cliff so that the great pit we descended is freely open, enlarge the second constriction to the average diameter of the tunnel and then instead of a periodic trickle lasting say two hours, we will get a full torrent for at least twelve, or maybe more if we cut a deeper channel. Meanwhile a few thousand labourers can be cutting a canal from the lake here to the nearest point of the old river-bed and the lake near Grakok will speedily be filled and the whole area of desert irrigated."

"Splendid, but after a while will not the reservoir be emptied to such an extent that the tides will cease to reach the tunnel?" I objected.

"With such a huge volume of water, that will take centuries and can be countered to some extent by rigging up a pumping station. But I hope that before that necessity arises a definite rainfall will have been established, which by drawing the water back from the crater will maintain the central reservoir at a constant level. Meanwhile the Graks must be instructed to suspend all the moisture-extracting devices in their cities so that as the centuries pass the contents of their great cisterns may help further to humidise the atmosphere. Also I will advise the synthetic manufacture of water on a large scale."

"But how will they be better off than they are now?" I argued. "They seem to have all they require."

"When the desert is properly irrigated and vegetation re-established," he retorted, "they will be able to emerge from the conditions of beleaguered citizens merely holding on to life and to spread over the country as an open-air race of agriculturalists. They will be able to mine and utilise the great mineral wealth of this marvellous planet and be able to develop their wonderful science to the benefit of themselves and of mankind." Here he stopped short as if he had said more than he meant, but I seized on his words.

"You mean that you intend to establish constant intercourse between the Earth and Ganymede, trading say mineral wealth for seeds and manufactured goods. What an utterly splendid idea. Why, man, the possibilities are endless."

Plant smiled. Evidently the idea of being the regenerator of a planet, a twentieth century composite of Osiris, Prometheus and Hiawatha had taken deep hold of his imagination and, having been induced to divulge his dream,

he welcomed my enthusiasm. However his only comment was:

"Well, well, we shall see. We have done a pretty fair amount of killing and destroying and it will be nice to do some saving and restoring for a change."

The next day we set off in a south-westerly direction with the intention of finding if there were any great obstacles to the plan of cutting a canal from the oasis to the old river bed. We found that the job could be more easily accomplished than we had expected, for after a few miles we came upon a natural gully that led approximately in the correct direction.

"We will set one gang of workers excavating here as soon as they arrive," decided my friend, "whilst another lot tackles the blasting and tunnelling near the reservoir."

"But it has just occurred to me," I put in, "how will you manage the periods of high tide?"

"Our first job will be to enlarge the exit from the first chamber so as to prevent the water from banking up the way it did when we were there. That will give us a certain refuge, but I hope that we will be able to construct some platform or other point of vantage above high-water mark in the great cavern, so that I may be able to study the tidal conditions fully."

IN our enthusiasm over this unique scheme to rehydrate a planet, we had not forgotten our plans for an early return to earth. We considered however that we would have ample time in the four and a half months that yet remained to us for us to get the engineering operations completed and to get back to Grakok in time to get *The Comet* ready for her earthward journey. We had received reassuring tidings from Grakok that the

manufacture of a satisfactory substitute for plantite was proceeding slowly but steadily, and we could do nothing for the present in that direction.

So keen had we become on our plan for the rewatering of Ganymede, that I am sure that rather than abandon the project we would both gladly have reconciled ourselves to another thirteen months on this interesting world.

Whilst we were waiting for the vanguard of the Grak labour contingent to arrive, we decided to fill in the intervening weeks exploring along the water-course which led eastward from the end of the lake. Plant studied this carefully.

"We shall have to build a dam across here before we let the increased water through, or it will be running off in the wrong direction. We can establish a Grak city on the oasis so that the dam can be kept in repair. The size of this oasis can be greatly increased by irrigation and the growth of the edible plants encouraged."

"We must also set detachments of Graks to work clearing up the young and egg repositories of the yellow fliers. It will give them a change of diet from their fungus cakes," I added.

Our preparations for our journey did not take long, for we did not intend to make an extended tour. Of food we took enough to last us for ten days as we hoped to be able to supplement our rations from such vegetation as we had now proved to be innocuous. As regards water, we judged that one bottle each would suffice, as we expected periodically to be overtaken by the overflow from the lake even if we did not come across any pools in the river bed. We did not anticipate encountering any formidable animals, but in addition to the new clubs the labourers had made for us, we took one HCN

(hydrocyanic) and one fulminate bomb in our rucksacks. These with the compass, binoculars and our pocket knives made up our full equipment. We had decided moreover to dispense with any escort and so did not wear our headgear. Plant however took his in his rucksack in case we needed to send back any message.

We only made about eighteen miles during our first day's march, for we stopped many times when the appearance of the stream-bed and banks prompted us to examine them more carefully for possible mineral ores. Having selected a smooth open spot beside a little pool, we encamped for the "night", in accordance with our usual custom of dividing the hours to correspond with our terrestrial habits.

After our meal, Plant stretched himself out to sleep, whilst I took first watch, for although we had not seen any animal of a size likely to harm us, we decided not to take any chances. As I sat there, mentally I recapitulated all the exciting and almost incredible happenings of the last months. The starting of *The Comet*, the mishap, the blind journey through space, our landing on this strange yet fascinating world and the immediate encounter with its chief inhabitants. Then mentally I reviewed our desperate fights with the savage, scarlet Krugs, the slaughter in the laboratory and on the plain, the colossal hecatombs of the Quireek and of our expedition against Krugok, ending with the burning of that ancient stronghold.

Then came the long journey up the ages-dried river bed, the climbing of the mountain, the exploration of the huge crater and descent to the great cavern beneath it, the terrible fight with the Rotarians and the nightmare ordeal in the flooded chamber. In memory I retraversed the weary

length of the twenty-mile tunnel and thrilled with horror at the recollection of those awful hours when drug-bound and helpless I awaited a loathsome death, as the unwilling foster father of a mass of ugly white-grubs.

MEASURED by incident as time is always mentally measured, old Mother Earth seemed almost to be the scene of some half-forgotten former life, rather than our home of less than a year ago.

Engrossed with these memories, I did not at first notice that the positions of some of the bushes around us seemed to be somewhat different from when I had first sat down. Half inclined to dismiss the notion as a figment of my imagination, I nevertheless kept my eyes fixed on a large growth immediately in front of me.

Surely enough I was not mistaken after all, it was coming closer, and so were those of its fellows I could see in my half-circle of vision. The manner of progression of these ambulating plants was different from the rather ludicrous panicky flight of their cousins of the oasis, and more strangely sinister. So near were they now that I could see that the roots that were spread over the surface were all actuated by waves of wriggling progress with regular elongations and constrictions in the manner of so many earthworms or caterpillars. At length some ten of these strange creatures fronted me at a distance of about eight feet, their rubbery limbs, that were divided and subdivided into thin, tentacular twigs, all slowly moving to point in our direction. I had stretched out my hand to wake Plant, when suddenly I felt a burning stab on the back of my neck. The palm that I slapped to the spot encountered a yielding substance and came away smeared with blood.

Leaping to my feet with a cry I spun round to find myself confronted by a dozen or so of the walking plants that had approached unsuspected from our rear. Unceremoniously kicking my sleeping comrade in the side, I grabbed up my club and as the sinister growths closed in on us with a combined rush, I commenced to lay about me desperately in all directions; until Plant rose to his feet and took up half the circle of defence.

We were successful in checking any further advance, but our blows made little impression on the rubber-like branches for, though terribly enough every contact of our clubs evoked a shrill scream from our attackers, the part we struck merely yielded to the blow and sprang back again to its original position.

"Try striking at their roots," I cried, and here we found our attack more successful, for with a series of falsetto squeals those struck retreated out of reach. Following up our advantage we drove them in front of us farther back, then, on turning, found that those in our rear had followed us up with equal speed so that the ring that surrounded us was no larger than before.

"There is only one thing to be done," I gasped. "Drive these back from our rucksacks and pick them up. Ready. Good. Now sling on your rucksack and jump." and setting the example I leapt clear over the encircling horde and then, with Plant at my heels, ran towards the higher rocky ground where I hoped our strange enemies would be slow to follow us.

"I am afraid that I am but an indifferent guard," I confessed "but who would have thought that a bunch of vegetables would have shown such bloodthirsty savagery?"

It was only now that I became con-

scious that the burning pain in my neck had not abated. Examining the place, Plant described the wound as about two inches long, badly inflamed and having the appearance of having been scratched by a score of needles set comb-wise. It was at least eight hours before the throbbing ceased.

Although our enemies approached as far as the rocky ground, as I anticipated, they did not attempt to cross it. None the less we spent the remainder of the night watching them turn about, with a tall rock at our backs. Long before we resumed our journey, the whole crew of predatory plants had resumed their former places beside the stream-bed and in their "innocent" immobility conveyed little suggestion of the circle of screaming fiends that had surrounded us a few hours before.

For three days more we journeyed down the water course, being overtaken once by the tidal overflow of the lake which here made a stream of very moderate dimensions.

CHAPTER XVIII

ALONE ON GANYMEDE

THE end of the fourth day found us looking down on to a cliff-walled valley, which from the point we stood, widened to about one mile across. In the centre of this valley, which was level and park-like, was a shallow lake in which the intermittent river apparently terminated. Vegetable growths of many kinds could be discerned, many of types we had not yet encountered. Of animal life our binoculars revealed no trace, except that the waters of the lake were from time to time disturbed, as if some bulky animal lurked beneath its surface.

"I think a day might profitably be

spent in exploring that valley," commented Plant. "After which we had better be getting back to the oasis. I am anxious to get on with our plans for irrigating Ganymede."

Poor chap, how could he have guessed aught of the weeks of dread and anguish that were to intervene before his cherished scheme could see fruition? Two inestimable blessings are provided by man's mental limitations. The anguish of the past is rapidly mitigated by the passage of time and the sufferings of the future are concealed from us. Were it otherwise the world would hold even fewer fully sane people than it does at present.

We encamped on the higher ground in preference to risking the unknown dangers of the valley and after breakfast made the descent to the hollow that lay before us bathed in the pale light of the rising sun blended with that of the splendid planet overhead.

The floor of this enclosed glen was carpeted with a reddish turf-like growth, with long thin cylindrical stems that yielded to the tread like a bed of moss. The trees were for the most part of a larger kind than we had yet encountered and were widely separated. At one end of the lake an agglomeration of smaller growths made a closely interwoven thicket, whilst above us the cliff walls rose sheer to an average height of 150 feet. Here and there on the smooth walls we could discern large round protuberances about ten feet in diameter and seemingly composed of a different material.

By the edge of the lake we detected the movement of some large, dark-coloured animal and cautiously approached to examine it more closely. We found to our surprise that this was another type of Ganymede's winged fauna, but of far greater size than any

that we had yet seen. The body, six feet at least in length was so sharply divided into two distinct segments by a long waist as to have the appearance of a gigantic dumb-bell. The head was relatively small and the wings when shown at their full stretch were transparent, glowing with iridescent colours and were at least ten feet from tip to tip.

This formidable-looking creature was however engaged in the perfectly harmless occupation of kneading the mud at the lake edge into the semblance of a large football with which it presently flew away towards the cliff-wall on our right. There it proceeded to plaster the stiff mud ball to a partly-completed structure, which we now saw was one of the large rounded protuberances in the making.

When the mud ball had been satisfactorily plastered down, the great black mason returned to the lakeside for a fresh supply, with which the big mud dome was completed, except for an aperture some two feet across leading into the hollow interior.

"Quite interesting," commented my companion, "but let us get on with our exploring, as I would prefer to get out of this place before bed-time."

Side by side we strolled towards the far end of the lake and satisfied ourselves that the stream continued no farther.

HAVING made the complete circuit of the lake, we were continuing up the other bank when suddenly a shrill whirring hum sounded behind us and some heavy body hurled me headlong to the ground. Rising half-dazed, I was horrified to see Plant lying on his back striving desperately to escape from the clutches of the huge black winged animal that bestrode him.

Before I could sufficiently collect my thoughts and regain the club that had been knocked from my grasp, I was petrified with horror to see my friend's attacker bring forward its rear end and plunge a sharp lancet-like sting deep into his body. With a shrill cry he collapsed and lay still. Even as, half-crazed with grief, I sprang forward unarmed as I was, the great beast with a whirr of shimmering wings rose from the ground bearing the lifeless body in its grasp. Up and up it soared and then with a sidelong swoop made straight for the mud structure it had plastered against the cliff wall over seventy feet from the ground. There under my horror-stricken gaze it thrust into the opening the body of my poor friend, apparently pushed it well to the back of the inner chamber, then, spreading its great wings again, it swooped down straight towards me.

I was barely in time to throw myself full length on the ground, when with a loud whirring it passed just over me. Recovering my club as I did so, I rose to my feet and stood ready to meet its next attack. As a determined fighter however it was not in the same class as the other Ganymedan enemies we had encountered, for a single blow on the side of the head caused it to beat a hasty retreat, nor did it again approach me.

Making sure that the creature had had enough of fighting, I commenced, sick with grief, to try and find some manner in which I could reach my poor comrade's body so as to give it reverent burial, before setting out on my lonely journey back to the only friends I had left on this far-off world, now grown repellent and terrifying in my eyes. I soon found that the cliff was far too sheer and smooth for any human being to scale and careful examination

of every inch of surface above the mud structure revealed no slightest crevice or inequality that could make approach from above possible. Nor could I find growing in the valley anything from which could be made any sort of a rope by which a descent might be attempted.

Whilst I was thus frantically searching high and low, I noticed that the evil-looking cause of my distress had made several journeys to and from its lair carrying in its grasp on each passage thither the body of a fair-sized animal of some sort, but of a species I was not able to identify. After the seventh such journey it again visited the lake side and prepared other balls of stiff mud with which one by one it gradually filled up the opening. When but a small hole remained it passed its rear end through this for a moment, then closed the aperture completely, smoothed the outer surface carefully and flew away over the cliff top and out of sight, leaving me feeling more utterly alone than I have ever before felt in my life.

For two days, earth-time, I remained in the valley unable to tear myself away from the vicinity of my dear friend's body, then fearing that the utter loneliness would slowly drive me insane, I dejectedly reascended the sloping approach and set out on my four days tramp back to the oasis. As a matter of fact I reached it in less than three days, for in my restless state I halted only the bare minimum time for food and rested only when utterly exhausted. At length completely worn out and spent with stress and strain, I saw the little lake before me. As I staggered the last few yards I noticed that the whole oasis was thickly thronged with Graks, workers, soldiers and Crarns, the first outnumbering the others ten-fold.

Making my way to the place in which I had left my headgear, I adjusted it and approached a body of Crarns who stood awaiting me expectantly. To them I recounted as well as I could the terrible fate that had befallen my friend and conveyed a mental picture of the great flying monster that had borne him off.

Their answering thoughts seemed to indicate regret as far as such emotional beings were capable of feeling any emotion. Also they informed me that they had succeeded in making what they thought was a satisfactory substitute for plantite, that only required to be tested to make certain of its suitability.

In return, after I had rested somewhat, I told them all about the mountain crater and the lake in the great cavern and outlined to them Plant's scheme for the rehydrating of their planet; for I was determined that even were I able to leave Ganymede alone, a feat I greatly doubted my ability to perform, I would leave behind me this splendid monument to my friend's memory.

The Crarns were at once keenly interested in the idea and asked several questions which showed that their knowledge of engineering was fully capable of coping with such a scheme and utilising its advantages to the full.

Without delay several thousand workers were despatched to commence the canal from the lake in the direction of the main river-bed, whilst as soon as the next tidal flow had ceased, another strong detachment, well supplied with explosives, started off into the interior of the mountain to carry out the job of widening the tunnel. It was planned that as soon as they arrived at the lake a platform should be at once erected of rocks and cement to

well above high water level, and was to be used as a base from which future operations could be conducted. The blasting away of the final obstruction was to be left in the hands of a selected body, who, with a strong body-guard of soldiers, were then to make their way along the shore, up the passage to the bed of the crater and back across it and down the ravine, at the foot of which a cache of food and water was to be left in readiness. All these arrangements, which it took a couple of days to plan and prepare for, having been completed, I felt that there was nothing further for me to do but wait with such patience as I could muster for their consummation, before I returned to Grakok and made such efforts as I was able to put *The Comet* into commission for a solitary return to earth.

CHAPTER XIX

A VOICE FROM THE DEAD

IT was now seven days since I had seen the limp and lifeless body of my friend being carried aloft by the terrible black monster and rammed into the giant mud nest on the wall of the inaccessible cliff and I was still inconsolably wandering about the oasis and planning where to place the dam which would forever shut off the water from flowing away eastwards down the stream bed we had followed so contentedly together less than a fortnight ago.

I derived some degree of morbid satisfaction from the thought that by so doing I would probably be causing the extermination of the brood and all the kindred of the creature that had brought upon me this grief, as well as of the walking plants that had attacked us in such a loathesomely persis-

tent manner on our outward journey.

Vivid as was my mental picture of my comrade's personality, I was nevertheless startled beyond measure suddenly to hear his voice calling to me.

"Ronald, Ronald, help, help."

Like a flash I spun round, expecting to see my dear friend standing behind me, in some way miraculously restored to life, but I was alone. Excitedly I dashed through the encircling vegetation calling him by name.

"Plant, Plant. Where are you?"

Again came his voice.

"Ronald, come and help me. I am here in the dark. Come quickly."

Suddenly it dawned on me that I was not hearing his voice with my ears but inside my brain. Plant was telepathing. His headgear had, I knew, been in his rucksack when he was carried off. He must have been able to adjust it and was sending out an appeal to me to bring him succor before it was too late.

Back at once I sent the message. "I am coming with all the speed I can. Hold on, I am on the oasis but I am starting at once."

It was a matter of a few minutes only to inform the Crarns of the message that had come to me and of a short hour to prepare a relieving expedition. Food, water, a few assorted bombs and a quantity of Krug skins, packed in rucksacks and we were ready. Twenty soldiers and ten workers made up our party and within the hour we were marching east at the fastest pace we could keep up.

During our first halt, which was of the briefest possible duration, I again got into communication with Plant and heard that he was slightly better than before as he had managed to get some food from his rucksack. His water bottle unfortunately was nearly empty, as he had not refilled it since

entering the valley and he was already suffering from thirst.

Also he had now pulled down his visor and could see enough of his situation to make him anxious, apart from his dire need of water, for me to make the best speed I could.

I informed him that we had already made twenty-five miles and would continue by forced marches for the whole distance. I also sent him a mental picture of the position in which I believed him to be situated on the side of the cliff.

I then devoted myself to cutting the Krugs' skin we had brought into long strips, which I proceeded to braid together to form a rope. At each halt I continued this work until I had made a strong hide lariat nearly eighty feet in length.

I kept up hourly conversations with Plant to encourage him with reports of our progress. I learnt something of his sufferings in his lofty perch and was consumed by anxiety lest he might become delirious and throw himself down to his death before I could reach him, for he had now succeeded in cutting a hole through the mud wall. Shortly afterwards all messages ceased which redoubled my anxiety.

SUCH was the speed we maintained that little more than two and a half days sufficed to bring us to the valley. Sending half my bodyguard down into the hollow, I at once led the other half along the top of the cliff.

Arrived opposite the middle of the lake, I commenced calling my friend's name but at first in vain. At length, however, I was rewarded by hearing a faint response from below me. From where I stood I could not see down the cliff, but was guided by the Graks be-

low to a position immediately above my friend's perch.

I then tied the end of my hide lariat round my waist and gave instructions that I was to be lowered slowly over the edge, my party on the top being directed by those standing below. In another five minutes I was seated astride the mud dome, and, half laughing and half crying, was watching my poor friend greedily drinking from the water bottle I had brought with me.

After a few minutes he was sufficiently revived to slip round his waist the noose at the end of the rope and allow himself to be hauled up to the top of the cliff. The rope was then lowered for me and, after securing his rucksack which contained the precious compass and binoculars, I soon scrambled up beside him.

He was too weak to travel, so we encamped for the night at the top of the cliff, having set a strict guard against any enemy that might approach; the detachment below us keeping similar watch. After a good sleep, plenty of water and a meal of some of the more sustaining fruits from the valley, Plant was able to give me an account of the experiences he had undergone since the time I saw him snatched from my sight.

"I was absolutely helpless in the grip of that great black monster," he commenced, "and could do nothing to ward off the deadly stab. This was given with extreme precision in the epigastrium. One searing shock and I lost consciousness, the nerves of the solar plexus having been no doubt completely paralyzed.

"When I partly awoke from the deep coma in which I had been plunged, I was in complete darkness and was conscious of little save an acute stabbing pain in the region of

my diaphragm and an agony of laboured respiration. For a long time I was unable to move hand or foot, but gradually as my breathing became easier I managed to wriggle round sufficiently to reach the rucksack that was still attached to my back, for I was desperately thirsty.

"The first article I encountered was my headgear. This with some difficulty I adjusted hoping thereby to get into touch with you, unless indeed you had shared my fate. That part you know, but you can hardly fully realize the joy with which I got your reply assuring me of your own safety and giving me renewed hope as to my own. That your message came from the oasis proved that a considerable time had elapsed since my loss of consciousness, but it was not until I had managed to pull down my visor and consult my watch that I realized that a full week had passed.

"By this time I had become conscious of a most unpleasant smell and discovered that packed up against me were a number of lifeless bodies of strange animals about the size of small goats. Also I heard a curious slobbering, munching noise, but it was some time before I could ascertain the cause of it.

"I appeared to be in an almost circular chamber about eight feet across and lined with dried mud. Under a blow of my fist the wall sounded hollow and to my mind at once leapt the thought that I was shut up inside the mud dome that the black flying brute had been constructing on the cliff, a supposition that you later confirmed. After that I made all my movements with great care, being haunted by the fear of being precipitated to my death through a hole in the mud wall, the strength of which I did not then realize.

"Having found my provisions, I made a good meal but was dismayed to find how little water I had in my bottle and resolved, despite the temptation to drink the whole lot at once, to ration myself strictly.

"Finding the stench becoming insupportable I got out my pocket knife and standing up proceeded to attack the dome of my confined quarters. The task was far more difficult than I expected, for not only was the mud at least a foot in thickness but had been treated and packed in such a way as to render it of considerable hardness. This achieved, I sank back exhausted and probably slept for several hours.

"I awoke to a consciousness of raging thirst and also that the slobbery chewing sound was appreciably louder and that the heap of bodies was being moved as if something was pushing or pulling at them. After some straining and peering I managed to perceive the cause, a sight calculated to produce a sensation of nausea even on recollection.

"Within a few feet of me and steadily chewing its way into the pile of bodies was a great repulsive whitish grub about the size of a large retriever dog. Clearly I was part of the provisions with which the mother had stocked her nest before sealing it up with her egg inside. Being of a higher organization than her other victims, I had recovered earlier from the paralysing effects of her sting, for I now realised that the other victims were not dead but merely paralysed and helpless.

"Soon this loathesome imp would have finished its ghastly banquet and would attempt to devour me in turn. I realised with a feeling of horror that except for my penknife I had no weapon to oppose its attack for obviously either poison and explosive

bombs would be equally fatal to myself. Rather than wait till it had further increased in size and strength, which it appeared to be doing hourly, I resolved to attempt the nauseous task at once.

"Such however was my sense of repulsion towards the monstrosity that I could not bring myself to attack it at close quarters. Opening the biggest blade of my pocket knife I accordingly proceeded to cut the Krugskin shoulder-strap of my rucksack into strips, which I knotted together into one length. To this I attached my knife by closing down the corkscrew on one end and tying it securely.

"I now had a small harpoon which I could cast again and again, recovering it after each throw by means of the thong. My first attempt buried the blade and half the handle into the wriggling horror, causing it for a moment to stop its slobbering meal. Again and again I pierced it until a green slimy exudation was pouring out of it from a score of holes, but still it continued eating as before.

"Finally in desperation I concentrated my aim on the head and mouth-jaws, which in time I succeeded in completely severing from the body.

When the animal was dead I sank back in utter exhaustion, weakened by stress, fatigue, thirst and famine, for I could force but little food down my parched throat. After a few hours of semi-coma, I was able to muster up enough energy and resolution to enlarge the hole in the dome and throw out the repulsive débris that half covered the floor.

"As the hours slowly passed on leaden feet, I lay most of the time in a half-comatose condition in my prison, knowing that you were straining every nerve to reach me and deter-

mined to hold on to life to the last gasp. At times I roused myself to gaze out up the valley in the direction I expected you, for I had enlarged the hole down that wall with this idea in view. To ease the intolerable throbbing in my head I had long since removed my headgear and so did not receive any of the later messages you doubtless sent out.

"Then as through a mist I heard your voice and looking out I saw the Graks standing below and guessed that I was saved. The rest you know."

A GLANCE at my comrade's white face and emaciated body was enough to indicate the terrible ordeal through which he had passed, and I knew that it would be many weeks before the poignancy of his sufferings became dimmed in his mind. Plenty of food and rest and the interest of his cherished irrigation scheme would however go far in assisting a return to complete health.

When he had finished his story, I gave him a full account of all that had transpired and the directions I had given to the two detachments of Grak labourers. He fully approved of my plans and seemed greatly moved at the thought, that it had been my desire thus to perpetuate his memory on Ganymede, for his hand closed on mine in a warm grasp.

However he was in hopes that he might be able to see the final consummation of the blasting operation at the shore of the great lake and the first rush of the subterranean waters to join the old water-course to Grakok. Fearing that in his enthusiasm he might overstrain his weakened body I persuaded him to accept the less arduous but equally satisfying alternative of standing beside the new canal when the released waters came

gushing from the mountain side on their way to revivify the parched desert.

DURING this conversation Plant had been sitting on the cliff top overlooking the Grak encampment in the valley below. Suddenly he clutched my arm with a startled exclamation.

"My God, Ronald, what fresh horror is that?"

Following the direction of his gaze I speedily saw that his cry was not the result of overwrought nerves, but was drawn from him by the sight of the awesome object that was slowly emerging from the lake.

This new terror resembled nothing I had ever seen before. Imagine a shapeless mass of jelly that had the power of protruding a part of itself like a pointing finger and then letting itself literally flow into the extended portion and of repeating this process from any part of its circumference, and you will have a sufficiently macabre picture to contemplate. If you further imagine this shapeless mass of jelly to be of a lambent green colour, to be some forty feet in diameter and to be advancing up the bank of the lake in the rough form of a crescent, the tips of which had already almost outflanked the fifteen unsuspecting Graks in the valley, you will have formed some idea of the terrifying nature of the sight on which we looked down.

Hurriedly clapping on the headgear I had laid aside during Plant's recital, I sent a rapid warning to our allies.

"Krug, krug. Run, run. Do not fight. We will kill it."

The five labourers at once responded to the warning and fled before the advancing horns of the half moon could intercept them, but the soldiers, true to the instinctive tradition of

their caste, formed up in a defensive semicircle to resist the onslaught of this utterly strange enemy, nor did they heed my frantic orders to run for their lives.

"A bomb quickly, Ronald," cried Plant.

"Too late for that now," I replied, reluctantly as I held one poised to throw. "It is too close to our friends. I would only kill the whole lot."

Helpless and fascinated by the grim sight, we watched the on-flowing tide of green now lapping at the feet of the ten Graks who stood at bay below us. Suddenly one of them stooped and slashed at the jelly lump, slicing from it a large piece which fell back on to the main mass and was at once reunited with it.

Now all ten were vigorously ripping away great pieces, which were no sooner separated than they joined up again. This determined defence had however the effect of holding back the centre, but meanwhile the flanks had stretched out two long encircling fingers, which at length united in the rear of our desperately fighting allies. Then by allowing half its bulk to flow into these investing arms, this uncanny and apparently invulnerable monster had the soldiers in its centre.

The end was not long delayed, for with a rapid movement the green circle closed in and the next moment our ten Graks were lying struggling helplessly on the surface of the jelly, which in another minute had completely enveloped them.

Sick with horror and unable to aid, we watched this ghastly termination of the hopeless struggle, but now as the sated monster commenced to finger its way back to the lake, we took up the fight.

"If we could not save the poor crea-

tures, we can at least avenge them," I cried and hurled my bomb into the midst of the retiring lump.

There being no shock of impact with the spongy-object, the bomb did not explode but was simply enveloped. Seizing another I hurled it to strike the ground just in advance of the gruesome thing.

The missile sped true and rent the flowing mass into a dozen fragments.

CHAPTER XX

THE BALL PEOPLE

PLANT spent the day and night resting and recuperating at the top of the cliff and after the forced marches of the last three days I was perfectly willing to remain with him and rest my aching limbs. Several times on waking from a doze I started up and looked about me fearing that the incidents of his rescue might prove to have been a dream and that I might have awakened to find myself the only living human being on the face of Ganymede with the nearest of my kind half a thousand million miles distant across the trackless void.

At the sight of my dear comrade lying by my side pale and thin indeed, but miraculously returned from the dead, I sank back with a sigh of relief.

After another night's sleep I felt so completely rested that I decided to finish the exploration of the valley before we started back, for though I had several times traversed it from end to end on our previous visit, I had been too distraught with grief to take proper note of minor details. Also I decided to secure Plant's club, which no doubt still lay where he had dropped it.

A few minutes' search sufficed to

find it and carrying it over my shoulder I continued my stroll, pausing now and again to gather an occasional ripe, yellow fruit at which I nibbled as I walked. I had reached the extreme end of the valley and was turning to retrace my steps up the other side of the lake, keeping a sharp look out for the green jelly beast, when my gaze became fixed on a part of the cliff before me.

Surely it was moving. Not knowing what fresh surprise this strange country might have in store I commenced to retreat slowly backwards like a Grak warrior, for I had no wish to lose sight of this new development. Then after some preliminary shaking, with a loud creaking noise, a part of the cliff wall about ten feet in diameter slid away revealing the entrance of a large cave or tunnel in the rock.

That in itself was startling enough but something far more startling was to come. As I watched, riveted to the ground by amazement, out from the opening poured a horde of the most curious creatures I have ever set eyes upon.

Their appearance was certainly more ludicrous than terrifying for they resembled nothing so much as large round footballs that bounced, hopped and rolled of their own accord towards me. Later, on closer examination, I found that they derived their power of movement from a multitude of short limbs set uniformly all over their bodies. Each leg was about four inches long and was furnished with a single sharp claw.

The power of vision they undoubtedly had, but I could never discern any trace of eyes. In color these curious beings could only be described as kaleidoscopic, for every imaginable color was represented amongst them, though on none of them did more than

one hue appear. They seemed to be constantly aware of this difference in their colours, for when they reached me and commenced to circle round me in dizzying gyrations, they contrived to group themselves into distinct patterns, irresistibly suggesting those curious toys of coloured glass fragments and mirrors that were popular during the last century.

Round and round me they whirled in a slowly contracting circle, their rapid rotations producing a loud whirling hum such as might come from a large top or a fast-moving circular saw. This noise was apparently loud enough to reach Plant's ears, for on turning my head I could see him standing on the edge of the cliff, the twenty Graks beside him, watching the strange sight in the valley below. He shouted something, but the distance was too great for his words to be distinguishable above the noise of the ball-folk's movements.

Soon I noticed that I was being gradually herded towards the tunnel in the cliff from which this multi-coloured throng had emerged. I still had possession of the club with which I might have fought a passage to freedom, or I might have easily enough leapt clear over them, but I felt no desire to injure these curious rather ludicrous-looking creatures. Also I had a lurking feeling that, were they angered, their nature might very easily change into something dangerously hostile.

IN addition to these considerations, I began to feel a certain degree of hypnotic influence induced by the rapid gyrations of the many-hued spheres before my eyes. Soon I found myself entering the passage and realised by the loud grinding creak that the door had closed behind me. Then

I was urged along the wide passage by the throng that surrounded me and rolled and bounced against my legs. After about a hundred yards, the tunnel widened out into a large and lofty hall, lighted by a suffused glow that seemed to emanate from the rock itself and having opening into it numerous openings that doubtless were the doorways of further passages.

In the centre of this fine apartment was a large flat table with several benches beside it, all curiously wrought from the solid rock. As I advanced into this chamber the ball-folk again formed a circle round me but this time they remained stationary in their ranks enabling me to examine them more closely. One bright scarlet chap bounced across the hall and disappeared through one of the openings on the far side. Soon he reappeared, but not alone, for accompanying him was a being, at the sight of whom, I stood more utterly amazed than at any of the grotesque or alarming creatures I had yet seen on Ganymede.

The knowledge that we had landed on a world far from our own had prepared me for the sight of things in every sense of the word unearthly, even as a traveller in an African jungle will expect to be confronted by the strange fauna of the tropics or the dusky forms of savage tribes. But imagine what would be the startled surprise of the traveller if, on entering a native hut, he found himself in a modern drawing room in the midst of a fashionably dressed throng in the act of consuming cocktails, and you will have some faint idea of my amazement at beholding the scarlet ball emerging from the passage followed by a tall fair-haired young girl about nineteen years of age dressed in a loose but exceedingly becoming

dress of some pale blue material that left her slender arms bare to the shoulder.

At sight of me she came forward with a welcoming smile.

"Oh, I am so glad to see you," she exclaimed in a curiously hesitating English with a charming slurring accent on some of the words. "It is ages since I saw anyone from my own world. You are from my world, are you not?" she added with an anxious look at my bearded face.

"Well, I expect so," I replied. "Anyhow I am from old Mother Earth, as I expect you are, though how you got here is an utter mystery to me. I thought my friend and I were the first people from the earth to travel to Ganymede."

"Earth! Ganmid!" she replied perplexed. "I do not understand these words. I am from Harki, the large blue orb that circles mighty Satos next to this strange globe which we call Nola. Where is Earth and Ganmid?"

"Well, Ganmid is what you call Nola and what you call Harki we have named Europa. The earth is very distant and circles the Sun far, far away, being the third in order from it, your Satos, which we call Jupiter, being the fifth."

"The Sun! That will be the ball of fire we call Zelo. The third world from it will be, let me see, yes Palk. But surely you can not have come from Palk. All our wise men affirm that that world is too close to fiery Zelo for life to exist on it."

"Nevertheless my friend and I came from Palk, as you call it, about a year of our time ago. But how came you here from Europa—Harki?"

"I will tell you, but first let me bring you some refreshment and send for your friend to come and join us.

Perhaps you may be able to find some way to free me from the power of these ball people, who have kept me captive ever since I landed on Nola, so long ago that I have ceased to count the passage of time."

"I will be glad to have some refreshment," I said, for I was remarkably thirsty after that last yellow fruit which had had a curious pungent taste, "but it were wiser not to bring my friend to join what appears to be a state of captivity. He can help us better from without."

Melo, as I learnt her name was, agreed with this and shortly after brought me in a tray with various fruits and a sort of wine in a tall goblet. Whilst I was eating she told me the story of how she came to be held captive in an alien world amongst this strange ball-folk. These, by the way, had now rolled themselves into a large evenly patterned circle against the walls of the large hall and took no further notice of us.

CHAPTER XXI

MELO'S STORY

"**K** NOW then, oh man from distant Palk," began Melo, "that my father, Sarkis, is the mightiest prince on the planet Harki, and, as his only daughter, a thousand nobles would gladly give their lives to protect me from a moment's danger. Were it but known in my father's kingdom where I am held captive, within the hour ten thousand great ships would be winging their way hither to rescue me.

"For my position here today I have but my own pride and obstinacy to thank. Always from my childhood have I been accustomed to have my way in all things and being of an adventurous nature I have long ago ex-

explored every part of the surface of Harki save only that portion that is turned away from great Satos where none may live owing to the great cold and lack of air. For years I had desired to visit one of the neighbouring worlds that, like our own, circle round Satos. My father's commands, however, were strict that I should never make the attempt, owing to the great danger of my small ship being drawn towards Satos and burnt to dust upon his glowing surface. Only Nola of all our neighbours could be visited in safety by even the most powerful of our ships and here they never come now, owing to its desert surface and the hordes of fierce, red creatures that infest it."

Here I interrupted to tell how we had brought to bear on the Krugs the resources of European civilisation and had exterminated these. Melo heard me patiently, but I could see that she did not believe me.

"No doubt you slew some of them," she granted, "but two men, even from Palk," with a note of sarcasm, "could hardly accomplish what my ancestors' armies had tried in vain.

"Nevertheless, being headstrong and self-willed, I determined to visit this place and alone, so that men might know that there is naught that Melo, princess of Harki, might not accomplish.

"Saying nothing of my plans to anyone, I set out one day when my father was in a distant part of his kingdom, and directed the nose of my craft towards Nola, that glowed low down in the sky like a bright yellow half circle. Such is the speed at which our fliers cross the void, that but a few hours sufficed to bring me close to the surface of the yellow globe. Swinging over the lever that shut off Nola's pull on the body of my ship, I

skimmed over his surface close to the ground.

"In one region I saw vast numbers of the fierce scarlet beasts and feared to land, also the country was but bare desert with several large purple mountains in its midst.

"I had decided to turn homeward from this uninteresting place when many miles ahead I saw a range of high white mountains greater than any I had ever seen on Harki and towards these I flew. As I neared them I espied below me a small valley enclosed by cliffs and containing a lake surrounded by plants such as I had never seen before. Cautiously I tested the outer air and found it safe to breathe, so on the impulse of the moment I landed beside the lake and emerged on the surface of Nola.

"A few yards only I ventured from my ship, for I knew not what strange monster might lurk in the lake or amidst the bushes. As I walked slowly towards the cliff, suddenly a part of it opened and out poured a host of these ball-folk and in an instant I was surrounded. I tried to make my way back to my ship, but they leapt and bounced so violently against me that, despite all my efforts, I was driven towards the hole in the cliff.

"Meanwhile several of them had hopped into my flying ship and I could hear them bouncing about inside. One of them must have bumped against the repulsion lever for to my horror I saw my ship rise from the ground. Frantically I tried to rush towards it but the clusters of ball-folk about my legs held me back. Soon my ship was level with the cliffs that enclosed the valley and now the balls inside realised that something was amiss, for one by one they appeared at the open doorway and leapt out and were smashed to death.

"Higher and still higher soared my vessel until it was but a speck in the sky and soon even that vanished.

"Now indeed was I punished for my disobedience. Stranded on a strange world hundreds of thousands of miles from my home, my position unknown to any of my folk and with no means of ever returning. Worse still it appeared that I was to be shut off even from the light of day, for the strange people that had captured me kept pushing me towards the tunnel from which they had emerged. Soon I had entered it and heard the rock close behind me.

"And here I have been ever since. I have not been injured in any way, but I am never allowed to go outside, except when surrounded by a host of these coloured balls and then only for brief periods and at long intervals. I have plenty to eat and drink and am at liberty to go where I will through the great network of passages and chambers that form the dwelling of this curious race.

"And now you have heard my story and we can plan if there be any method by which we can escape from this place, so that you may take me in your ship back to my father's kingdom. You will not find him ungrateful to one who has returned to him his only daughter," she concluded with a delightfully haughty toss of her golden head.

"Well, certainly these creatures do not appear very formidable in themselves," I commented, "but I am afraid that by sheer weight of numbers they will be able to keep us helpless. Of course, I could kill many of them did I desire," lifting my club, "but if I can I wish to avoid any action that may turn their present attitude into one of active hostility. After all they appear to mean us no

harm, merely wishing to keep us, as in my country men keep strange beasts as pets or for curiosity. Let us think the matter over carefully before we do anything. In the meantime you can show me some of this strange dwelling."

CHAPTER XXII

A STRANGE COMMUNITY

UNDER Melo's guidance I traversed long ranges of passages that penetrated the solid rock in all directions and which led into many chambers both large and small. Here we saw various phases of the lives of this bizarre race. One large room was one of the nurseries. Here thousands of infants, of about the size of golf balls, rolled slowly over the floor practising the use of their numerous tiny legs. I noticed that these were all of a uniform colour and remarked to my fair guide on this, asking at what age the colours developed.

"Only after they are proficient in rolling and hopping," she said. "The acquirement of a colour denotes a definite stage in their growth. Come, I will show you," she added leading me to another chamber.

Here another large throng of balls about the size of cricket balls were assiduously hopping and bouncing about the floor in a series of jumps that reached their acme near the walls. Completely skirting the apartment was a bench about two feet high, cut from the solid rock and pierced by a number of holes, each one large enough to admit one of the young balls. Whenever a ball succeeded in leaping on to this bench, it immediately rolled to a hole and disappeared.

"What is the reason of that?" I asked. "I can see that the height of

the bench is to test their agility, but where do they go?"

She replied by leading me down a winding passage to a lower level. Here we found ourselves in another large room, an exact replica of the one above it except that instead of the perforated bench around the walls, I saw a series of stone tanks each filled with a different coloured fluid. Above each tank was a hole which I guessed led to the testing room above. As I watched, through one hole after another a young ball would come to fall with a splash into the tank below it and sink beneath the surface.

"These are the dyeing baths," explained Melo. "They stay in them for two months till they are thoroughly coloured. See, there come some that are finished," pointing to several that, swollen now to six inches in diameter, were scrambling out of the tanks and rolling away down a small passage.

"Now let us go to the gymnasium where the adult balls keep themselves exercised."

THE gymnasium, whither we next made our way, was far more amusing. Here the ball-folk were playing several games, the purpose of which was not always apparent. One seemed to consist of hopping across the room in as few bounds as possible and at the last bounce striving to reach the top of a six-foot pillar against the wall at the summit of which was a cup-shaped depression to receive the successful athlete.

"And now," said Melo, as we made our way back to the apartment in which I had first seen her, "let us see what plan we can devise to escape from this place."

"First let us test the way by which we came in," I said and, picking up the club I had left on the table, I led

the way along the entrance passage. Soon, however, our way was completely blocked by the swarms of ball-folk that commenced to gather round us.

"Do not let them separate us," I cried, for this appeared to be their intention. Melo clutched my hand as we were jostled to and fro. As we struggled to keep together, so denser and denser grew the bouncing horde around us. Now, too, I noticed a distinctly savage note in their attack, for several times I felt the rasping scratch of their claws and I could see that Melo's face and arms were bleeding.

At last, becoming enraged and also somewhat alarmed at our position, I commenced to lay about me with my club at the surging mass of our opponents. As I felt them squash in scores before my blows, so did their numbers increase, until we were completely buried beneath their mass and Melo's hand was torn from my grasp. A few moments more I lashed about me, half-suffocated, as I heard Melo's despairing shriek. Then came a violent blow on the side of my head and all went black.

I awoke to the consciousness of a splitting headache and a vile taste in my mouth. Opening my eyes, I saw Plant bending over me and offering me a drink of water. I took a deep pull at the bottle and then sat up. I was lying on the reddish worm-like grass and in front of me rose the cliff-wall, sheer and unbroken as before.

"What has happened?" I asked. "And where is Melo? Did you rescue her too?"

Plant looked at me anxiously.

"That is all right, old man. You will be feeling better in a bit. Just take it easy. You seem to have given

yourself a deuce of a crack on the head."

"Did you see it? What happened?" I asked for my brain was still awlirl.

"I was watching you from the cliff top," he cried. "You were walking along eating some fruit you had just plucked, when suddenly you stopped for a moment, then commenced to lash about all around you as if fighting some enemy I could not see. Then you appeared to have struck yourself on the head with your club, for you went down like a pole-axed bullock. I did not dare to delay in case that green brute came out of the water, so I got the Graks to lower me on the end of the lariat at a spot where the cliff is lower and hurried to your side. Are you feeling a bit better now?"

"Yes, yes," I cried impatiently, "but what about Melo and the ball-folk? Where have they gone to?" and hurriedly I gave him an account of my adventures inside the cliff.

Plant picked up the half-eaten fruit that lay near at hand.

"I think the explanation will be found in this," he said. "If you look at it carefully, you will notice that it is somewhat different from any we have eaten so far. It undoubtedly contains some potent drug that produces an effect similar to that produced by hashish, or Indian hemp, or bhang, as it is variously called. Your whole adventure was of the nature of a hallucinatory dream."

CHAPTER XXIII

THE LAKE REFILLS

I WAS not long throwing off the effect of the drug I had taken and together we made our way to the hanging lariat by means of which we were drawn up the cliff, Plant's

strength being unequal to the long walk up the valley. Two days more we camped above the lake, till Plant felt fit to commence the journey back. During that time we did not again see the green jelly-beast, nor, needless to say, did we again see the ball-folk, though Plant used chaffingly to insist that I kept a continual watch on that part of the cliff wall. Certainly my "pipe-dream" had left a very vivid impression on my mind and I could not rid myself of a tinge of regret that the fair-haired Melo was but a figment of a drugged imagination.

We took seven days to reach the oasis, as we made comparatively short daily marches and three times the stream-bed came gushing to meet us ere we again sighted the oasis. Here we encountered a scene of restless activity and found that the work on the canal had made considerable progress during my absence. As I have already stated, the Graks are expert engineers and sappers and the work had been planned and carried out with great skill.

Reports from the great cavern told of considerable progress in that quarter also, though it was anticipated that several weeks would elapse before the final blasting operation was attempted. That being the case, we decided to pay another visit to the spot to relieve the comparative monotony of the waiting period. This journey we undertook a couple of weeks after our return to the oasis, by which time Plant had fully recovered his strength.

By the time we left, the work of building the dam across the water-course was well in hand and we had the satisfaction of knowing that it was only a matter of time before the black fliers, the peripatetic bushes

and the green jelly-monster would die from drought. Strict guard was kept to prevent any of the first named coming to the oasis.

Well fed and in good spirits, the walk through the tunnel did not appear one half its former length and we accomplished it easily in one day. We found that already the constricted part of the tunnel next the first chamber had been widened and the great rock on which we had slept had been considerably undermined.

A large platform had been raised against the cliff a hundred yards from it and on this the Graks kept their stores and took refuge when not working. They reported that they had been several times attacked by the Rotarians, but had beaten them back without loss.

Plant noted carefully how high the full-tide water reached on the rock-wall and calculated roughly the duration and volume of the outward flow and also made a rough estimate of the period that must elapse before pumping operations would be necessary. Not knowing the extent of the lake beyond the rock-roof, he could only make an approximate guess regarding the latter, but was able to assert that such would not be necessary for at least 120 years, making no allowance for the water that must return to the lake when Ganymede's rainfall became reestablished.

As we had no desire to undertake the long climb and walk back *via* the crater, we waited only for one tide and then returned to the oasis.

ARRIVED there we had another important piece of work to put in hand. This was to construct a row of cement pillars across the exit of the tunnel, close enough to prevent any of the Rotarians from emerging

and finding their way to the oasis, the river and the Grakok lake, where they might easily become a serious pest. An opening was left to allow for the emergence of the last body of Graks, after which it would be closed to narrow dimensions by another pillar.

At length all was complete. The last Grak had appeared, leaving behind only the party that was to set off the mine and then make its way back by the crater. The last pillar was in position, the dam across the eastward river-bed was finished. The canal from the lake to the ravine we had discovered was cut and we were all standing on the rising ground above it and waiting anxiously for the final consummation of hours of careful thought and weeks of hard toil. Suddenly beneath our feet we felt the ground tremble slightly. Ten, fifteen, twenty minutes by our watches we waited. Had the carefully worked out plans failed after all?

No, first with a trickle, then with a rush and finally with a roar, a huge torrent of water burst through the pillar-guarded tunnel-mouth and descended the mountain side in a thundering cascade.

Across the oasis it plunged, sweeping away scores of trees where it overflowed the narrow channel. Through the lake it swept, swirling past the new dam into the deep-cut canal prepared to receive it.

A few minutes later we were looking down on a boiling torrent that foamed and roared, deepening and widening its bed as it went, hissing and whirling down the natural ravine to join the old river-bed that had known no water for tens of thousands of years. Then to follow it for over a thousand miles, to fill the empty lake-bed before Grakok, thence to be

led by a hundred canals to irrigate the parched and lifeless desert, that needed but the revivifying water to produce a luxuriant vegetation.

Tensely and obviously deeply moved, Plant stood watching this realization of his great dream. Turning to him, I wrung his hand, excitedly shouting:

"Hurrah! Success! Eureka! Thalassa! Plant's River is on the map of Ganymede at last. A thousand congratulations."

My enthusiasm was effective in that it relieved his extreme tension and in a minute the two of us were capering about like a couple of excited school boys.

Behind us we heard the voice of the leading Crarn.

"Truly the power of your science is great, Travellers."

Laughing heartily we turned to greet him.

"Sure enough it is, old boy," I cried giving him a slap on the back that nearly sent him head-first into the stream, "and when we get back to Grakok we'll brew enough boot-leg to lay every Crarn flat on his back for a week."

OUR return journey to Grakok was accomplished quickly and easily for as soon as we passed the first few miles of cataract, we set a gang working to construct us a raft on which we could float at our ease down the broad river to our destination. This was made easily enough out of the bed of one of the carts made buoyant by having a number of hermetically-sealed bottles attached to its underside. A couple of cement paddles sufficed to keep us in the centre of the stream.

Whilst this was being prepared, we took half a dozen labourers with ruck-

sacks and travelled up the ravine far enough to collect a good load of gold; for, as Plant remarked, we would require a large amount of this useful commodity to finance the building of the large and improved Comet that he already had in mind.

With our somewhat primitive craft thus ballasted, we set forth on our thousand-mile drift down Plant's River to the great Grakok lake and to the reconditioning of *The Comet* for her homeward voyage.

"But don't expect to stop at Europa to call on King Sarkis," chaffed Plant.

On our arrival near Grakok, we found the lake already nearly half filled and rising rapidly. We were met by a large number of Crarns with an immense bodyguard of soldiers and were marched in something like triumphal procession back to the city in which we had our room.

From the window we gazed out on a scene vastly different from that which had greeted our eyes on our first awakening on Ganymede. Then nothing but arid desert met the gaze, with the hordes of savage scarlet Krugs patrolling it and the threatening stronghold named Krugok in the background. Now Krugok was a ruin still faintly smoking, the Krugs were exterminated and half the plain was already filled by a silver sheet of water that promised a fresh era of life and prosperity to the parched planet. In addition we had our notebooks well filled with valuable data, a great heap of gold at our feet and the satisfying knowledge that the means now existed of transferring it and ourselves across the pathless realms of space to our Earth, our country and our kin. All this had been accomplished in less than twelve months.

Well, I thought, might the leading Crarn remark:

"Truly the power of your science is great, Travellers."

As if the same thought had just struck Plant, he rose, took the bottle from the table and made his way to his laboratory.

CHAPTER XXIV

HOMEWARD BOUND

LEFT to myself my mind rehearsed again that terrible day when we had massacred the scarlet Krugs in their millions, by taking advantage of the annual Quireek to shower upon them an annihilating quantity of poison gas from the sky. In about eleven years time the next great flight would be due and the galleries and corridors be again thronged with hosts of the pink neophytes, ready to burst forth into the sunshine and whirl aloft in a dizzy aerial courtship.

No longer would they come to the ground to be at once devoured by the hungry red hordes in wait below. No longer, as of old, would all the predatory animals of the plains congregate to partake of the bountiful banquet. Instead, each pair would be at liberty to fulfil courtship's consummation and to start a fresh community.

By Jove! We hadn't thought of that. Deprived of their natural limitations to inordinate increase, the whole surface of Ganymede would in a few years be one seething mass of Graks, to support a tithe of which even the fertility restored by Plant's irrigation scheme would not suffice.

On Plant's return, I put the case to him and attempted to convey my conception of the state of things to which the amazing fecundity of the Graks would lead, when no longer held in check. He agreed with me as to the seriousness of the problem.

"There seems to be no solution of the difficulty save the time-honoured ones of emigration, war, or birth-control," he said. "The first has natural limitations, the second should be avoided at all costs as the antithesis of all progress and civilization, leaving only the third as a matter of practical politics. We must have a consultation with the Crarns on the matter. Probably this curious Law of the Community, which regulates the proportionate numbers of soldiers to labourers, can operate along the necessary lines."

At the first opportunity we discussed the matter with the leading Crarn, who held a brief discussion with some of his colleagues. His reply to us showed that the problem existed only in our own minds.

"We have debated the matter of the annual Quireek, Travellers," he said, "by which you fear that the whole land may in time become completely covered by new Grak communities, which might make our condition worse than when the savage Krugs invested us on every side. Had our deliverance from this persistent foe occurred many ages ago, such might have been the case, for then those who took part in the great flight both male and female were equally represented.

"However, for thousands of generations, owing to the fact that our enemies prevented the establishment of any fresh colonies, the Quireek has ceased to be a thing of practical utility and has become but a matter of useless show and formality, the empty repetition of an ingrained custom. The result of this, after the passage of ages, has been that those indulging in this useless sacrifice, solely for the sake of wearing shining apparel for a few hours, are now all females. I do

not know the customs of your own country (ok), Travellers, but it may be that you have parallel instances (chik truk, literally 'things of a hatching'). So have no fear of any disaster coming to us from our annual Quireek (lit. wing-showing)."

"By Jove!" I exclaimed, much relieved.

According to Plant's calculations we had only about three weeks in which to make our final overhaul of *The Comet* and to test the propulsive chemical that the Crarns had made for us, if we were to start off at the time that our Earth was most favourably situated with relation to Jupiter. The oxygenating and carbon dioxide-removing apparatus also needed to be refitted and carefully adjusted. The matter of victualling was a simple one and all our available space was packed with food and water in cement receptacles. To this end I sacrificed many of the paleontological specimens I had collected and Plant, much of his stock of minerals.

The Crarn chemists had done their work well and the modified plantite functioned perfectly, as we proved by several test flights of twenty miles or so up above the surface of Ganymede.

MAY 27th was the day that Plant had figured out as being the best for us to start on our return journey across the vast gulf of space that separated us from home. A few days before this date, we took part, a leading part, in an important and impressive ceremony.

For some days we had been preparing for this. From the highest peak of Grakok the apex had been cut so as to make a small plateau, 3,000 feet above the plain. In the centre of this a tall flagstaff of the wonderful Grakite cement had been erected.

These operations had been efficiently carried out by a large detachment of Graks, who by this time were ready to do anything that we might suggest.

Meanwhile Plant and I had been working hard with a heap of Krug skins, some of which had been bleached with chloride of lime and others stained with cobalt and with vermilion. From these, working only with our pocket knives and the nail scissors and using thin strips of leather for sewing, we had contrived to make a very presentable Union Jack, complete with woven throng halyards, a piece of work of which we were not a little proud.

On May 24th, Empire Day, all was ready and a general order was issued to all the Grak communities to parade in full force out on the open plain surrounding Grakok.

Plant and I and a representative body of the leading Crarns mounted to the artificial plateau, escorted by a strong bodyguard of soldiers. These had been provided with cement drums covered with Krug skin and had been carefully instructed in their use.

When all were in their stations, Plant and I approached the flagstaff and, having attached the flag to the halyards which were already in position, together we hauled it to the summit of the pole. This done, Plant turned to the assembly and solemnly took possession of the planet Ganymede in the name of the King and proclaimed it a British Crown Colony pending the decision of His Majesty's Government on the matter.

We then both saluted the Flag, sang "God Save the King" and signalled to the military escort. This sent forth from its improvised drums an impressive roll, to which the colossal multitude on the plain returned a pro-

longed volley of creaks and whistles, that came to our ears like a roar of distant thunder.

It now only needed the confirmation of our action by the British Government and a rudimentary knowledge of Latin for every Grak to be able to swell his chest and proudly creak "Civis Britannicus sum," even if he did not entirely understand the full significance of his proud boast.

The sun was due to rise on May 27th, and we had reckoned that by steering straight towards him as he rose above the eastern horizon we would ensure passing as far as possible away from great Jupiter, whose gravitational pull was one of the difficulties we would have to combat. Of course the dome that had been built over *The Comet* had been removed long before this. We had also maneuvered the shining vessel so that her nose pointed to just above smouldering Krugok.

When the fateful morning dawned the whole plain was thronged with expectant Graks, whilst a large body of Crarns led us in ceremony to our craft.

We said farewell by facing the Ganymedan intellectuals and sending out strong thoughts of friendship and

esteem; receiving similar messages in return.

"Farewell, Travellers," said our friend the leading Crarn, "journey in safety and return again to Grakok, for truly the power of your science is great."

"Farewell. We will return," replied Plant, handing to him a cement bottle carefully wrapped in red Krug skin. "Come, Ronald. Time is up."

Stepping aboard *The Comet*, we shut and screwed fast the door, made the necessary adjustments to the apparatus and then lay flat on our spring couches to mitigate somewhat the shock of starting.

Ere long Ganymede was a small star receding in the distance.

Of the round of receptions, banquets and presentations that followed; mainly memorable to us from the intense weariness they engendered in our suddenly reweighted bodies and the terrible dyspepsia resulting from the unaccustomed food; I have no wish to think. As soon as we might without causing offence, we thankfully withdrew to the comparative privacy of Plant's home in Devonshire, there to prepare our several accounts of our "unearthly" adventures. By Jove!

THE END

SWEET AS HONEY

Sweet as a well-seasoned pipe, on the first smoke! And the honey-curing keeps it sweet. Special attachment supplies (1) automatic free draft (2) double action condenser. The best pipe you can buy for \$1. Nothing else has its flavor.

\$1

YELLO-BOLE



The Crystalline Salvation

By GEORGE H. SCHEER, B. Sc. E.E.

The readers of AMAZING STORIES, we are sure, will welcome a flight beyond the stratosphere in the great outside universe. The adventures incident to such a flight are excellently presented in this story.

FIVE years had passed since the cataclysm, or should it be called such? The earth, pushed from its orbit by the space marauders had escaped its enemies when it was trapped in a warped space-plane and slipped through the momentary gap into another dimensional universe, leaving the vandals behind. Mars had not been so fortunate, or at least we did not believe so, for we had left everything else behind us, our sun, our planetary neighbors, and even our moon! Perhaps the vandals considered Mars too nearly gone to suit them, and had started on their quest anew.

At that time, the earth had been propelled so far from the sun that the temperature at the surface had dropped to a mean value of 150 degrees below zero. A new and more brilliant sun had saved us, and all of the severe readjustments as to orbit, temperature and length of day had been made. Of course, minor changes would continue for many, many years. Considering the vast changes, it was a wonder that any of us was alive. There had been earthquakes and vicious winds and rain, but not nearly as great as had been anticipated.

Most of the giant ray converters, which had furnished the power for the defensive destructive rays, had been transformed into heating units, and these alone had saved the billions on the face of our earth from a frigid

death. As the warmth of our new sun dispersed the icy chill which had almost precipitated the end of everything, more and more of these units had been taken from heating service and been put to normal services. Beam Transmission, Inc. was again functioning somewhere near normality, and freight and passenger services were carried on much as they had been eight years before.

Atomic power had made our tasks easy, and, though Beam Transmission, Inc. owned everything directly and indirectly, together with Dean Harvey and his hospitals, we took care of every need in the civilized world and made it an enjoyable place in which to live. Through beam transmission it was possible to dissolve material to be shipped at the transmitting station and to have it reappear at the receiving station exactly as it had left. This was true for living beings as well. The disintegration at the transmitting station, the transmission, and the reformation at the receiving end could be made to occupy the barest fraction of a second. The transmitters and receivers had been constructed to enormous proportions, so that tons upon tons of material or complete machinery could be shipped at once. The process was so inexpensive that it had replaced all other methods of shipping for all distances. No longer did freight trains puff across conti-



Twenty gleaming torpedoes, powered by hydrogen converters which knew no limits of power, awaited to respond to the merest touch of their masters.

nents, nor did giant steamers plow through the tumultuous oceans, nor did aeroplanes, gyrocopters and dirigibles laden with heavy shipments, fly through the clouds. There were as many passenger vehicles and autogiros as ever, but they were pleasure craft. Cities no longer belched forth smoke and acrid fumes. In their place loomed lofty, scintillating spires and office buildings, things of real beauty. Atomic power had done away with dirt and soot and smoke. The great harm done in holding off the attacking spaceships had begun to heal. Forests had been replanted, and crops were being harvested to replace the synthetic and unpalatable foods which had been necessities for those many years.

MANY times I sat and dreamed of all that had passed, things so strange as to seem untrue. Of our terrible trip to Mars on a beam from a transmitter, and of our memorable battle with the marauders. We had been on an electron many years before that, where we had seemingly lived a dream with the Sarians and the super-intelligent creatures called Fyns. Lele, my wife, was a Sarian, brought from an electron in a brick wall! All seemingly impossible, but all of us had stopped wondering after our varied experiences and took many marvelous things for granted. It had all begun during engineering studies at the University when Pearson and I were working on our theses. Kroelich had been our instructor, and Harvey the dean of mathematics. Now the four of us controlled Beam Transmission, Inc. and the world!

"Weren't Carter, Thibault and Cook to give us their findings on the present state of affairs of our new galaxy?" asked Pearson as we sat in the

hundredth floor office one bright afternoon.

"They will be here very shortly, I imagine," I answered. "Their task has been no easy one, you'll remember. Think how many centuries were necessary to determine as many of the facts as we knew about our old sun and neighbors. I am very curious to know what the radiant energy is of this new source. If I remember correctly, at the time we slipped from the established order of things, the sun was radiating about fifty horsepower per square inch! Not so much, except that the sun was nearly a million miles in diameter, and, deliver me from converting the area of such a sphere to square inches!"

"Kroelich should do that," laughed Pearson. "His computing ability hasn't been exercised enough lately!"

"Well," drawled Kroelich, "you give me something worthwhile and we'll just see if we are as rusty as you suppose. For instance, in that old sun, about which you were just talking, mass was being converted into energy at the rate of one ounce per, well, 1,73 followed by 15 ciphers foot-pounds. That was direct conversion, and not combustion. Our present atomic generators which we think are quite efficient and inexpensive, which they are, relatively speaking, are certainly pushed out of the picture when you consider a star and its energy. What we need to do is to find some way to bring about the transfer of matter into energy completely, but we don't have the millions of degrees of temperature found in the interiors of some of the stars, nor do we have the inconceivable pressures either. So, I'll just put the figures down and put them away until we can find some means of using at least part of that energy."

"I believe the astronomers are here now," said Calloway.

"Yes, but don't bother to get up. They'll come right in," I answered.

For two hours we heard the reports of the three astronomers, found how large our new luminary was, found how many new planetary neighbors we had acquired, and received some idea of how large our present galaxy was. Nothing was familiar, for our year had changed and our day had changed in this new dimension. We did learn some rather annoying facts, especially that, although we had a larger sun now, it was older and the planets had been inhabited for countless ages before life had even begun on our earth. Interplanetary travel then must have been commonplace, but whether we would be unwelcome or welcome to our neighbors in our berth was a serious question and probably one which would be raised some time in the near future. An event like a suddenly appearing new planet would certainly be worthy of an investigation!

"I'm thinking that all of our power inverters that we used for producing the destructive rays should not be discarded," said Pearson. "If we hadn't had the screen protection we did, we should not now be here to tell the tale. And the more I see of spaceships, the more I wish that we had sufficient power available to be absolutely certain of our defenses against any enemy or any odds! It is an unpleasant feeling, we'll all agree, to sit around and watch an enemy pound our ion screens to the breakdown point, and to know that a few more rays at a tenuous point would collapse the whole defense. We've seen it in such a condition too often, I believe."

"Nor will we ever forget it!" shuddered Kroelich. "I sincerely hope that

we won't live to see those days over again. But with new neighbors, who can tell what is in store for us? This business of trying to go about your own business and not bother anyone has been a pretty difficult thing to do with marauding spaceships interfering at any time!"

"Perhaps," I mused, "We should think along those lines ourselves. If we had a space armada imposing enough in appearance, we shouldn't be prey to our neighbors. Instead, even though we are babies in this universe, we might put up a very commendable front and maintain a bluff for years to come. I am in favor of at least thinking of something like that, though we may not do it for some little time. The reason I mentioned it is because the earth is quickly healing and hiding the scars of the last encounter, and we shall be free to think of such things before so very long, now."

"It takes a bunch of jolts and other unpleasant experiences to make you forget space-travel, doesn't it, Bell?" laughed Pearson. "Have you already forgotten how nearly we were killed in our little jaunt to Mars? True, I found Vola there, and she is worth any number of hairbreath escapes such as we had, but I don't care for them as a steady diet when they can be easily avoided. Yet, I'll admit that the thoughts of such things are entertaining when one hasn't much to do otherwise. Our system of beam transmission is far too efficient, that's all. There isn't enough work to do or enough improvements to make."

"That's just why we should go in for this kind of thing," agreed Kroelich. "Life isn't the dead thing it used to be with nothing in the papers but kidnappings, hold-ups and gang murders. All of that is gone. I can even

remember radio programs in which advertisers spoiled half of the musical programs, and when we had a very crude system called television!"

"Well," said Pearson, "My father had the first gasoline automobile in town in his early days—way back when? Must have been in 1910 or thereabouts."

"There has been constant development in every century," said Callo-way. "But it seems that everything new adds impetus, and discoveries come faster every year. Think what schools will be like a century from now, if the scholars must learn all that we learned and everything that happens from now till then in addition. Deliver me!"

"Say!" I interrupted, "We can't very well use a beam for space travel you know, and we need more power than our present atomic generators will deliver if we want a sizable screen armament. How about the three 'geniuses'?"

"You know what they got us into the last time, but, go ahead. Every time they start on something, we end up by finishing it in the proving stage, and one of these times we'll be finished too," mourned Pearson. "But, go ahead, I repeat. You always do spoil my quiet and peaceful life!"

"You're getting old and palsied with your 'quiet and peaceful life', too. You need to take off some of that surplus weight, Pearson!" teased Kroelich. "I don't see how Vola can bear to even look at you."

Kroelich did not have time to say any more because, one after another, books came sailing at him. After a few minutes the hubbub subsided, and I rang for the three "geniuses," the foremost men in science of the day, Krinsti, Obert and Waller. I have often said that, if a problem had a solu-

tion, one or all of these men could find it. They had the laboratories of the world at their command, and inexhaustible resources. What was possible to accomplish, they accomplished!

THE three, ordinary looking men came in without any apparent gifts of genius. Indeed, on the street, they would be taken for ordinary clerks or office workers. Yet, within these three minds, for the most part, had developed everything which had given us control of the entire world, for everyone depended on our organization, almost to the air he breathed.

"The ships will be easy, gentlemen," said Waller quietly. "Our atomic generators would furnish sufficient motive power also, but not enough to give us an impenetrable ion screen. Perhaps our experiments in releasing energy from the hydrogen atom will lead us to the solution. I can report quite favorably on that experiment at this time. It would be out of the question to depend upon velocity alone to accomplish the leaving of the earth, for, with no air resistance, it would require a speed of five miles per second, and, with air resistance taken into consideration, as encountered on the earth's surface, it would need to be of the order of seven miles per second. It would require too long to reach such velocities in the first place, and, in the second place, the friction of the air would be too great. The acceleration is necessarily low for living beings, and a gradually widening spiral path would need to be followed. Many circlings of the earth would be required, and, in this case, the ship would be destroyed by the heat of friction between the shell and the air. No sufficient means of cooling could be conveniently devised. We must use some method of ray repulsion from

the earth or other great mass to the ship, in other words, a force to nullify the effects of the earth's gravitational field.

"Speaking of the hydrogen atom, and the release of its energy, the cosmic radiations, which, by the way, are quite evident in this new universe as you already know, result from the building up of atoms, and not from their destruction. Our present generators destroy the atoms, reducing them to lower energy forms, but, with the new system, it will be different. If we take hydrogen with an atomic weight of 1.0078 and build the helium atom of atomic weight four, we would necessarily have the difference between the four hydrogen atoms or 4.0312 minus the atomic weight of the helium atom, four or .0312 as pure energy, created or rather converted from the mass lost. Since helium is a perfectly stable form with two more protons than electrons in the nucleus, we need only to build up the nucleus of the hydrogen atom to produce the helium atom. This can be done when we develop our proton generator from the present alpha generator in which we hope to impart hitherto unknown velocities to the helium ions, and we should have little difficulty in knocking off the requisite number of electrons from half of the hydrogen atoms. Working backward from one of Einstein's concepts which states that the radiation resulting from the expulsion of an electron from an atom is of a frequency which is itself the difference in frequency of the radiation striking the atom and the frequency necessary to expel the atom, we can determine accurately our necessary frequencies."

From then on the scientists' explanations and results of their researches were too much for all of us except,

perhaps, Kroelich, but I know that even he missed half of it. There was little doubt of the truth of the explanations, and these men could talk only in terms of laborious equations and complex variables. One not familiar with the problem of releasing the energy by building up helium atoms from atoms of hydrogen might think that the problem was solved when he heard the information given by the three men, but I knew they had been working on this problem for years, and, I also knew that it would be the most difficult problem of solution that anyone had yet come up against.

But, with all talents bent on one subject, it was a surprisingly small interval of time, months only, until the first helium atoms had been built up from hydrogen. True, only a small number had been produced, but the men working on the problem knew with what tremendous forces they were dealing, and, by special precautions, they hoped to remain alive to continue their work. From the figures mentioned earlier with respect to the energy released by the sun, it does not take a great imagination to conceive the terrible forces which the scientists were handling, and the least error might not be only fatal, but might erase several square miles of the city and snuff out millions of lives. To these men, the building up of enough helium atoms to be detected was all they required to assure the success of their project.

THE first twenty spaceships of the armada were monstrous but beautiful creations, embodying every thought of hundreds of experienced men. They were a thousand feet long, four hundred feet in diameter and shaped like giant cigars at the ends for none other than esthetic reasons.

In space there would be no friction to overcome, so that any shape or size would be as good as any other. Still, with all of the strange and unbelievable things we had seen in the last decade, we clung to our old ideas of form. Since it did not interfere with utility, we gave no other thought to it.

Within these twenty ships were laboratories and instruments far too numerous to mention. Every possible thing necessary for making cosmic radiation measurements, telescopic observations, and even planetary explorations was included. Batteries of oxygen generators, water generators, carbon dioxide absorbers, and hundreds of other necessities lined the pilot rooms and main engine rooms. Fifteen thousand men could make any trip comfortably in this fleet, though we thought nothing of the number which could be carried, other than the necessary observers and operators. The main power units were still being developed and would comprise the final installation. Most of the difficulties had been overcome. We were all a bit disappointed in the complexity of the necessary accompanying apparatus, as compared with our reliable and relatively simple atomic generators, but the multiplication of power over our now obsolete units was a figure beyond ordinary human conception.

"The ships will all be completed together, and they will take off together!" I said as we watched the busy building yards. "Think what an impression we shall make as we serenely cruise to explore this system of ours. No longer shall we depend on a beam on which to ride and be pushed or pulled. No longer is insufficient power an annoying factor, nor is time. We will have with us every necessary thing. Remember the Martians telling us of the vandals, who tried to

take our earth from us? They said that these things had been searching for a world similar to theirs from before the time that life was beginning in its elementary forms on this earth. Of course, we won't have to do anything like that, but we know that we have heretofore unknown and undreamed of freedom. But the earth will always be a welcome refuge when we tire of traveling the endless and lonely highways of the heavens!"

"Yes, just perhaps they are lonely!" said Pearson. "Excuse me for spoiling the pretty picture you were painting, but our luck is not of the best even on our earth, much less off of it. Nevertheless, I certainly have a longing to try it out, though I know my better judgement says 'no,' as it has before on occasions similar to this."

"Nothing chanced, nothing gained, old boy," reminded Kroelich. "By the way, what velocities can we reach?"

"Dean Harvey says there is no theoretical limit, so long as our practical acceleration is low enough not to harm us physically. Wonder how we could demonstrate the contraction of bodies with increasing velocities. From the formula it is evident that at 160,000 miles per second a body has only one half the length it has when at rest, that is, it is shortened in the line of motion. This has been experimentally proven, but we should never know it in our case, because everything is relative. It is rather annoying to think about it, but if we won't realize it, and it does not harm us, what is the difference?"

"What I should like to do would be to prove the limiting case, which is, of course, that a body has no length in the line of motion when it is traveling with the velocity of light," added Kroelich.

"Nothing doing!" and Pearson shook his head. "I'm not curious enough to wish to find that out, even though I might need a little reducing around my belt line. I'd rather be a live coward than a dead hero!"

IT was with little surprise that we learned, one day, that evidences of spaceships were seen about our nearest planetary neighbor, a planet twice our diameter, situated farther from the sun than we were. The distances separating us from the other planets outside our orbit had made impossible anything but the most general of observations. There was another nearby planet closer to the sun than we were, but, for our conception of life, it was uninhabitable. We named the planet which was creating so much interest, Gamma. The innermost was Alpha, and we were Beta.

At last the day came when all twenty spaceships were in readiness for the trial flights. Dean Harvey, Kroelich, Pearson, Waller, the scientist, and Carter, the astronomer, were on the flagship. Needless to say, there was no keeping Pearson's wife, Vola, or my wife, Lele, from the maiden voyage of the greatest armada human eyes had ever beheld assembled. Twenty gleaming torpedoes, powered by hydrogen converters which knew no limits of power, awaited to respond to the merest touch of their masters. They glistened in the bright morning sunlight, beautiful to behold. Screens absolutely impenetrable could be thrown around each ship, screens only misty in appearance, but more protective than a mile thickness of the toughest of alloyed steels! It took tremendous power to build up and maintain these protective screens, but we had power at our disposal, in these twenty ships, which dwarfed, in com-

parison, the total power we had used in warding off the attackers of our solar system, and we then had thought the limit had been reached. We could no longer use indicators which read millions of kilowatts. A new, arbitrary unit had to be chosen. For ordinary cruising, we did not even begin to touch the possibilities, but since power was the thing we had in abundance, we were prepared to use it, should the necessity arise.

With thumping hearts we stood at the simple tiny push button controls which would make these ships handle like mere toys,—millions of tons of metal under perfect control. I should have given anything, except the privilege of being in the flagship, to have viewed the mighty spectacle that millions of people saw from the ground, twenty giant cruisers rising majestically into the skies, slowly at first, circling in perfect formation, and then hurtling off with unbelievable ease to become tiny, shiny dots in the deep blue of the heavens.

I know that everyone on the ships was thrilled to the very core of his being. To us, it was an unmatched achievement. We were free to come and go as we pleased! We had defenses without equal, and formidable armament to the greatest attacking fleet we could imagine. Perhaps my words sound bloodthirsty, but I can account for it easily when I review the terrible struggles through which we had gone. There was such a feeling of security in having a fleet like this. We could not see how the earth could again be molested for any great length of time, for even now, designs were being made for the hydrogen converters which would feed the positive ion screens for covering the earth's surface with a perfect protection.

FOR hours we played with the fleet. Everything answered perfectly. Our velocity was limited only by time and acceleration. Never during the short trial cruise did we use more than a ten-thousandth of our maximum power. Such a reserve seems unreasonable, but the power available was so great that it was really more convenient to design units to handle so much more than to build them so very small that they would furnish only the necessary amount of power.

I know that, at the banquet held that night in honor of the momentous occasion, not one person's eyes were free from tears, nor one person's heart without the greatest thrill it had ever felt. Everything was hilarity, congratulations, dreams, hopes, and the conquest of space. No one cared for the hour, nor could he speak of anything but the experiment, which had become a proven fact. The six of us were toasted until I, at least, thought it had become a habit, but no less were Waller, Obert and Krinsti, the three men who had made the whole thing possible. What wonders were in store for us now? Everything was speculation, dreams of the wildest nature, all of new discoveries, conquests and happiness. It was just a game, with everything free to the finder, but we reckoned without fate that night, as we had reckoned without fate in the years gone by.

Needless to say, after a celebration such as we had had, it took more than a day or two to get back to earth literally. There were many aching heads, of course, but it had all been worth it, since everything was an open book to us now. For fully two weeks, while further preparations were being made for the first real exploration cruise, hardly a statement was made which was based on bald facts. Every-

thing was conjecture about the approaching voyage into the void. Even sensible, systematic men, who needed everything written in black and white for definite proof, were dreaming of what we might find. Years before, Lele had wondered what the Martians looked like, and it was impossible to keep her highly imaginative mind off of the subject until we saw with our own eyes what their appearance was. But now, with Vola almost Lele's shadow, and with a mind as active as Lele's, it is difficult to describe what the gentlemen in their company had to stand in the way of bizarreness. Of course, everyone of us was forming opinions, but I did my best to form no conclusions of what we might find or what the intelligent beings in this system looked like. We had seen the Fyns, which deviated so far from our concepts of intelligent beings, and we had come into direct contact with the space vandals, though we had not seen them, which could not even be described to us, because there was no medium for comparison. What we were to see might be commonplace or it might be vastly different from our wildest imaginings. We hoped to learn from experience as soon as we could.

IN years gone by, we had dreaded the beginnings of our voyages. The worst was the voyage of a few feet to an electron, worst because it was our first and something so different from anything we had known before. The second to Mars had been nearly fatal twice, once when we were very nearly captured by our moon, and then as we lost our power when only a few hundreds of miles from the surface of Mars. The one voyage entirely out of our control had been the earth's slide into this new space plane.

Now, in the light of all of the harrowing experiences we had undergone and suffered, we were voluntarily taking another, the outcome of which we could not even hope to guess. Perhaps we were hardened space-travelers? Or had our senses become so accustomed to the impossible that they required such stimuli to give any reaction? There is no telling. We had had fears before on our voyages, but I know that no one had the least hint of one this time. We were anticipating the thrills of a great adventure, an adventure which should surpass all others we had had, combined. Time never had passed so slowly before, we were certain!

"I'm getting calloused to this sort of thing!" sneered Pearson in fun as we finally embarked for the stupendous undertaking. "This business is getting tiresome. Let's have a real thrill this time!"

"You may get more than you are bargaining for, young fellow," said Dean Harvey. "I'm an old man, but I expect to see more different things on this voyage than I've seen during my whole lifetime! I can think of nothing I should rather do, and all of this has become possible in so short a time. Why, the changes in the established order of things on this earth, barring beam transmission and atomic power, would have taken centuries in any normal age. We have outgrown our very planet!"

So we had, and we were about to leave her for perhaps many months. We had decided upon our former figure for acceleration, namely, about seven feet per second per second, not too comfortable, but we had enormous distances to cover, and we wished to waste as little time in transit as was possible. Outer space was not crowded, and we could use velocities of

tremendous figures. Once before we had attained a speed of 900,000 miles an hour, but we hoped to dwarf that figure on this cruise!

"Everything ready?" asked Kroelich after the space-tight seals had been made.

"I'll try the signals," said Pearson in answer.

One by one the ready signals appeared on the instrument board. Finally the last showed that the final position was in readiness.

"We are off!" I whispered hoarsely. I had made many voyages perhaps more exciting than this would prove to be, but the thrill, the sudden realization of what we were really doing, gripped and frightened me beyond description. Everyone else felt as I did, I know.

OUR course was laid to the nearest outside planet, the one which had shown evidence of habitation. It would take three days to reach it, and, on the way, many photographic charts would be made of the heavens so new to us. Out of the atmosphere, there would be no air to cause aberration in telescopic observations, and the limiting features would be imperfections in the magnifying mirrors, extremely minute at the worst—magnifications a million times greater than earthly magnifications could be used with the same definition.

Our armada was fast leaving the atmosphere, and the latter's diffusing effect was becoming less and less, as evidenced by the darkening of the sky from deep blue to almost black. Although we had left in daylight, stars were becoming visible, and the sun's disc showed streamers shooting out into space. Another few hours would find us in utter blackness of space with the earth a half moon, luminous

in the new sunlight. The stars would be piercing, dazzling points of whiteness with no twinkling.

There was not a sound in the void, save those we made within our ships. The hydrogen converters which furnished energy to produce the repulsion ray which was forcing us from the sun, upon which we were focused, made no noise which we could hear in the pilot room. Now and then a signal buzzer or a bell would break the stillness. For the most part, we did little talking, being satisfied to remain quiet, filled with awe at the wonders unfolding before us. The blackness of interstellar space is a thing absolutely indescribable. As long as I live, and as many voyages as I am privileged to make into the void, I shall always feel the utmost enjoyment, the greatest of thrills, and the realization of what insignificant things we proud mortals are, just trifles, no more important than cosmic dust!

Save for a faint luminous fringe all about us, due, no doubt, to a slight film of air held by the attraction of the hulls, and occluding gases from the outside metal walls, there was nothing except blackness and the tiny beads of light which seemed to be reaching out to us, so that we might touch them. The sun was still too bright and too large to look upon directly. The vastness and the wonder of it all made us choke with the great awe which arose within us. We had definitely conquered space; not only space, but a new universe!

It was not many hours out when we began getting details of the surface of our neighbor. It, too, had an atmosphere of oxygen mixed with inert gases, and water vapor hung in clouds over a good portion of its surface. Ships were definitely visible on the projection screen before us, and

something else was visible which brought back memories. It was definitely ascertained that this planet, Gamma, was either hostile or anticipated hostile visitations, for an electronic screen completely encircled it!

"No doubt they know of our coming," surmised Kroelich.

"I don't believe we can blame them so very much for being prepared," answered Dean Harvey. "I guess our great fleet is an imposing spectacle even to this system which probably has had interplanetary wars for countless centuries."

"I wonder," I said, "whether it is always kept up or if we are the sole reason? Let's try signalling them. Operator, make ready!"

We all gasped at what happened in answer to our radio signals after just a few seconds of elapsed time. The screen about the planet glowed to sudden brilliance as though it were alive. It seemed actually to vibrate and scintillate.

"Looks as if they had learned a very definite lesson at some time or another," offered Pearson. "I'm just a little bit glad that we have the power we have, for I've never seen a screen as dense as that one before! Where do they get all of that energy? Probably building up helium atoms is old stuff to them."

"I doubt if they do it in that manner," said the dean. "More than likely they convert space radiations directly to bombard atoms and free the electrons. And I should add that it requires a tremendous field to maintain that many free electrons and prevent them from combining with everything else!"

"It looks as if we would never find out unless we can prove to them that we are not on a hostile mission to anyone," I said. "There is little use in

trying to break through that screen if we could. That would make matters even worse, for the evidence would all be against us. Remember how the space vandals destroyed our beam transmitters? Perhaps they were just showing a friendly attitude, but I should never have guessed it!"

A sudden thought struck me then. "I hope that this fleet stays at home, however, for our new hydrogen converters will not be completed for months, and the earth is inadequately protected with the few atomic generators for the screen which we left connected for that purpose. I guess I am worrying unnecessarily, though."

We were now near enough to penetrate the dense screen with our instruments of detection, though we could see nothing with the naked eye through that wall of electrons. Our own screens were up to nullify the radiations and protect ourselves. The display of coruscations did not help our case any either, for, as to the inhabitants, they supposed we were molesting them. Our curiosity was too great to be denied, however, and we remained slowly cruising about, viewing the strange squat cities through our filters, and watching the giant battleships of the air as they laid in readiness behind the planet's screen.

"I'd suggest that we be in readiness for anything. This inactivity on their part can't last indefinitely. See that the protective relays are adjusted for maximum sensitivity!" I ordered.

There was no telling what would happen if we stayed much longer, but I knew that we would now be perfectly safe.

"Relay the messages to all of the ships of the fleet!"

So suddenly that we did not know what had struck us, the screen on the planet seemed to thin until it was per-

fectly transparent at all but one point. Here, for an instant only, was a brilliant white spot. The next we knew, this aggregation of countless, surging electrons was hurled at us like the mythical thunderbolt. Had it not been for the relays, we should have been resolved into our molecules! As it was, we were all blinded by the flash that occurred as our positive ion screen met the electronic bombardment. For thousands of miles, luminous streamers of hydrogen, formed when our screen-protons combined with the electrons, flared and rushed. A deafening roar resounded in the thin atmosphere about us as the hydrogen, hyperactive, burned fiercely. Only for a fraction of a second did the flow last, but the heavens all about us were hazy with hydrogen, and perhaps other gases of higher atomic weight, for, under such a bombardment, many formations must have occurred. With our repulsion rays focused on the sun behind us, and with the automatic relays furnishing the control of the necessary power, we had not moved a measurable fraction of an inch from our position at the time of the impact! I dread to think of what would have happened had we not been as though a solid shaft connected us directly with the inconceivable mass and inertia of the center of the solar system.

The screen was again dense over the entire planet, or, as far as we could see, for it may have been let down on the remainder of the surface after the inhabitants had made certain that all of the ships were in one group together.

AFTER we had regained our composure, Pearson was the first to speak. "What a whack! They certainly know how to throw that bunch of

electrons. And I can see now that they don't rely on either atomic power or hydrogen converters. That blow came straight from space energy. What control they can exercise!"

"They wouldn't be easy antagonists for anyone, I can tell you!" I answered.

"Here comes another!" shouted Kroelich as the screen again became tenuous and a bolt was hurled toward us. Again the relays snapped, and luminous hydrogen atoms sizzled from the point of impact of the free electrons and our positive ion screen.

"We could play a nasty trick on them," I said after the second attack. "When they muster up that charge we could easily break through the screen anywhere else, but we have no quarrel with them. Let's go on with our journey."

Had we but had an inkling of what was to follow later, we would have reduced the surface of the planet to dust, and the inhabitants with it!

As we left, no more bombardments were made, but the planet's screen remained dense until we were millions of miles from our touchy and unsovable neighbor.

"Well, that's something interesting to start out with," said Pearson. "I thought this would be just a pleasant little exploration trip, and immediately we start off with fireworks. It has been many a day since I've seen such displays. Of course, I'm not hoping for any more, but, it does two things. First, it shows that we are invulnerable, and, second, the trip now interests me. This is a different sort of a universe. Apparently the millions of years that it is older than our old system has taught the inhabitants that wars are inevitable, though peace is to be desired. Preparedness is the proper motto and watchword!"

"Do we want to go on to the next planet, or do we want to see what that little hazy speck is off to the, let us say, left? We have no directions now, of course. Dean Harvey tells me that the spot is not too far removed from us, and that the spectroscope is doing all sorts of strange antics. The sensitivity has been reduced ten thousand times, but still there are evidences of some sort of violent activity never before connected with such radiations. All sorts of Fraunhofer lines which are commonly associated with the hydrogen atom," asked Kroelich.

"I am of the opinion that we should establish this disturbance as our outer radius and visit the planets on our return trip," I offered.

"That suits us!" added Lele and Vola, so we were off.

FOR weeks we traveled with ever increasing velocity at an acceleration of five or six feet per second per second. Relays continuously clicked as stellar dust, asteroids and meteorites were disintegrated to gases as we hurtled along. Had they not been, the smallest of particles would have punctured our tough alloyed hides as a pin would prick a balloon, so great was our kinetic energy.

It had not been so much of a task to once more become accustomed to a diet of synthetic foods, manufactured day by day on board the space-ships. We had had fresh food for such a short period of time since the earth's journey to this new dimension, that we almost immediately forgot about it. The hydrogen converters were working to perfection with never a single sign of trouble. Of course, they were still barely operating, so great was their limiting capacity. One converter was being taxed more and more.

That was the one which maintained an interference screen for cosmic radiations. As ordinarily met, they were imperceptible, but their intensity was becoming so great as we approached our goal, that they could never have been withstood. I thanked my stars for the men who had thought of this precaution. To make certain that nothing could go amiss, two more converters were paralleled with the original, though the latter was operating with a safety factor of hundreds. I wanted to take no chances that it would break down at this or subsequent points, for we should have died instantly. The entire fleet followed the same directions. Lest I should forget to again mention it, the fleet acted as a synchronized unit, and orders given on our flagship were relayed simultaneously to the other nineteen cruisers.

Dean Harvey once before had had a joke on us. His keen mind, and perhaps active imagination could formulate theories which usually turned out to be true. He had been the first to know what had happened when the earth had slipped into this new plane, and, again, he was about to predict a discovery of which no one had even dreamed. He had been exceedingly busy with the hyper-spectroscope, which now was becoming useless due to the intensity of the radiations. He was thinking rapidly as evidenced by his nervousness as he kept constant watch on a low powered telescope. Finally he was ready to speak, and all of us offered eager ears.

"I am a little afraid to say what I believe is ahead of us, and we must change our course to avoid it as much as possible. We have noticed all of the time that the cosmic radiations in this system are many times greater and more intense than those we used

to encounter. We are perhaps dangerously near something that has never before been definitely ascertained as being true, much less actually seen. We are approaching the mysterious realm of the atom, the secret of matter and energy themselves. This is only a tiny, isolated spot, of which there must be an infinite number. In fact, the spot is so tiny that it is insignificant, just a few millions of miles in extent, but it is going to show us something never seen before, and the pity of it is that we cannot comprehend one single bit of what we are to see. I truly feel that the mystery will be all the deeper after we have witnessed the spectacle now before us.

"What is stranger than all else, at least to me, is the fact that this is a macrocosmos demonstration. I never imagined that I should ever see anything like this. Rather, I should have expected to find only a nebulous cloud of diffusing and interchanging matter and energy, done on the atomic scale which we ordinarily consider. What we shall see is done on a tremendous scale. We will see atoms and electrons, or the evidences of them done on a small planetary scale. Only, we must not approach too closely, for here is matter in the making, energy so incalculable that our hydrogen converters, millions of them all working to full capacity could not make an impression on the rim of this whorl.

"Most of us know that the Fraunhofer lines discovered in the latter part of the nineteenth century result directly from the jumping of electrons in hydrogen atoms from various orbits. These orbits vary in distance from the nucleus as the squares of the consecutive numbers, 1, 2, 3, 4, 5, etc. Generally, they jump from shells of higher energy, which are the outer

orbits, to the lower energy shells, the inner ones, and the energy given up shows as a flash. When radiations from the outside strike the electrons, provided they are of correct frequency, the energy, added to some of the electrons struck, enables them to jump from an inner shell to one farther out from the nucleus. The flashes denoting the release of energy have very definite frequencies and are seen in the spectroscope as Fraunhofer lines.

"It is difficult to tell if this demonstration so near us is an exception, or whether we can really believe that planets about any star (sun) are only electrons about a proton in some greater system; the relative distances are the same, and the orbits of the planets always follow the same laws as the orbits of electrons in atomic structure. But, see for yourselves!"

We were coming as close to the dangerous whorl ahead of us as we dared. We could see brilliant flashes of dazzling light, and we had the impressions, at least, of small planets in violent motion. Though we were very nearly perfectly screened, it seemed that we could actually feel the effects of the natural display so near us. If only it could be seen distinctly! But what would it mean to us? We might see the building up of matter from energy or the changing of matter directly to radiant energy. The mystery would be only greater. The human mind would have been incapable of interpreting the truth, the fundamental truth. The never answered question, "Why?" would be more irritating than it ever had been before, for, after all, that question has never been answered, and we know it never will be. Answers may be formulated for everything but the very beginning of everything, the birthplace of matter and energy. We had witnessed a

sight which would never be forgotten by any of us, any of the thousands of men on the ships of our space fleet. So, with wondering minds, after days of observation of this unique display, we headed back for our planetary system.

MORE weeks passed, and we approached the planet in the next orbit to the one which was just outside of ours which we had visited on our voyage out.

"You see," said the dean in one of our numerous discussions, "the distances of the orbits from the sun very nearly follow the relative distances of electron-orbits from the proton. There is a marked similarity, only one major difference existing. In the atom, as we consider it to be, the nucleus is 1845 times as heavy in mass, or rather apparent mass of the electrons, all of the latter of which are the same, but the proton is smaller than the electron. In the solar systems with which we are familiar, the sun or nucleus is always greater in physical size in addition to being so much heavier than a planet. I feel, however, that the great similarities are not accidental, by any means!"

"Presumably, then," I continued, "we have just seen a sun and its satellites in the making? Probably there will be a disruption, and an 'atom' will be hurled out into the void. It would be relatively small as solar systems would go, as we calculated while we were observing the spectacle."

"Yes," answered Dean Harvey, "the solar system would be a midget. If that had been one of the giant sources of the universe, we should not have been able to get close enough to see or know anything. Why can't there be a midget or miniature, however? There are sports and freaks in nature,

and I am not so surprised, after all, that we found this one. The greatest of surprises was that twice, now, we have been fortunate enough to win a chance with odds of countless trillions! That warped space-plane was reached at precisely the right moment years ago, and this thing we have just seen may have no duplicate in all of infinity. By duplicate, I mean anything of the same order, and not something exactly like it, since there are no two things exactly alike in all creation."

Strangely enough, we found that the second planet had a protective screen surrounding it also. It was tenuous, however, and I wondered if the same thing would happen that happened before when we attempted to visit Gamma. When we were only a day out, the relays of the fleet were again adjusted to maximum sensitivity, and we were prepared for whatever might come to pass.

Surely enough, the screen became more dense as we approached, until it was a shimmering opaque sheet when we were a few thousand miles from the surface. Our filters enabled us to see the same types of battleships cruising about near the surface. The planet was many times larger than the other, but the same inhabitants seemed to exist, though we could see none of them.

AS before, and this time we knew what to expect, the screen of countless electrons before us suddenly became transparent as it was gathered at one point and hurled at us with tremendous velocity. The relays snapped, and a blinding flash, visible for millions of miles, temporarily blinded us in spite of the ray filters in the ports. Almost on the heels of the first bolt, a second and a third struck

us. We were a bit shaken and alarmed at this tremendous display of pyrotechnics, but everything held, and we were immune again. A fourth and fifth charge, each greater in intensity, were hurled at us. These neighbors meant business, and they were saying "hands off" in no uncertain tones! Suddenly a great mass of their battle cruisers went into formation and soared from the planet, hurtling directly toward us. There must have been two hundred, many larger than our ships.

Our cruisers immediately formed a cartwheel, with all sterns pointed to the center of an imaginary circle out there in space. We were ready to do battle, though we had not intended that our exploration trip should include anything of this unpleasant nature. We were learning to expect anything in space-navigation. War seemed to be inevitable in the constant battle for survival! Wars on earth had seemed foolish and costly, but we had little dreamed, in years gone by, that it was a common occurrence throughout the universe.

We felt quite secure with our armor and our offensive weapons, but we had our misgivings too. Adversaries who could directly control and guide space radiations were pretty mean antagonists, and we should have to exercise care and caution and keep our wits about us. Everyone was tense, but the stations were manned, and not one of us looked forward to anything but an exciting adventure which he would not have willingly missed.

The enemy ships, too, had the power to hurl bolts of electrons at us. These began bursting against our ion screens with great rapidity, aided by the same incessant bombardment from the surface of the planet. The cart wheel of sleek ships, which made

up our fleet, was invisible in the sheet of brilliant flame which enveloped us. There was some atmosphere at this level, and the incandescent hydrogen was combining with all of the available oxygen. The water vapor formed in the combination was immediately decomposed by the terrific heat, and reunited, in a continuous cycle. Now our coolers were operating, whereas, before, we required the production of heat to keep the ships comfortable as we cruised in the absolute zero of outer space, 460 degrees below zero, Fahrenheit.

New pencils of pale luminous rays reached out to us and added to the terrible beauty of the spectacle. Only once before had we seen anything to compare with such a space battle, that of the Sarians and Poruvians, many years before. I wished I could witness this display, if only for a moment, from a safe distance. Energy was being released at such a prodigious rate that a unit of a billion kilowatts would have been inadequate as a measuring unit. I felt very much as though we were approaching in intensity, the whorl of intercombining energy and matter which we had left but a few weeks before!

The battle had been a one-sided one long enough. We had merely been holding our position and warding off the rays and electronic bolts. Now we would open up and show our self-appointed enemies that we had power too, though they probably were aware of it after seeing us remain immovable under the terrific onslaught. They were using everything they had, and we could not even feel a tremor! But, if anything should go amiss, we should become cosmic dust in the millionth part of a second. All of our hydrogen converter units had been paralleled for any emergency load, but

so far they were just working comfortably, and nothing had gone wrong in the slightest detail.

"Let's try some neutralizing interference rays," Kroelich suggested. "That will give them something to think about!"

Slowly the frequency of a powerful destructive ray was varied until the screen of one of the enemy ships paled for an instant. That instant was enough, and twenty energy rays crashed against that hull. There was a great explosion of molten and vaporized metal, and one of the ships was disintegrated.

"I'm certainly glad that they cannot do that to us!" breathed Lele.

Vola and she had been with us all of the time. There was no point on the ship safer than any other, for, one slip and the entire thing would be nothing but vapor, we concluded.

"No, I'm glad that we use an ion screen instead of a wave screen!" agreed the dean.

The enemy ships, frightened by the loss of one of their first line cruisers, now varied the frequency of their protective screens, but it was not too difficult to follow the frequency and cause interference, if just for an instant. That instant was always enough to cause the brilliant end of the enemy ship.

WE had won a great victory, for, after a dozen ships had been annihilated, and we were still unscathed, the remainder of the fleet withdrew behind the planet's screen which opened for a short interval to permit them to come within the effective protection. The move had been too rapid for us, who were not expecting it, to have taken advantage of the break. We had no real quarrel with them, and had no reason to attempt

to reduce the surface of the planet to dust. We could not break down the electron screen, anyway, unless they hurled more electronic missiles at us. After several hours of observation, during which we all drew breaths of relief, we started for our own earth.

We had formed the conclusion that it was not likely that we should have friendly relations with the neighbors with whom we had come in contact, during our lifetimes. I saw, too, that we should need to keep up our defenses, which were entirely inadequate if we expected to hold our new place in this solar system, into which we had been cast. The Martians had advanced in civilization, though younger than this people, along peaceful and beneficial lines. We missed them as neighbors, but our exodus had not been of our own doing. Now we had to cope with vicious and warlike peoples. We were again isolated as the earth had been for millions of years in the past, isolated by interplanetary distances. We had conquered these, but we were in almost the same position in which we had been before! True, we could explore, but we doubted if any of the planets in the universe were inhabited by beings with gentle hearts.

Carter burst into the control room with wide eyes.

"Mr. Bell! There is a screen about the earth, and it is not an ion screen. It is electronic like the screens of the two planets we have encountered!"

We could not believe our ears, but we knew it must be the truth. Who would have changed the existing projectors to those necessary for the electron screen? It would have taken many months to have developed the generators and equipment necessary to have built up such a defense, and we had left no word that anything

like that was to have been done in our absence.

"Can we reach them by radio yet?" I asked in a trembling voice. No one had spoken since Carter's sudden entrance.

"It will be at least another day, Mr. Bell," replied the frightened operator.

Apparently the same terrible thought had gripped the minds of the others. The earth, almost unprepared, might have been captured outright by a fleet from Gamma.

Our acceleration was increased until our heads swam, and we were held as with iron bands against the backs of our fastened stools. The earth taken away from us, and we would be powerless to take it back for our own! The next day the earth was close enough for two-way communication by radio, but we could get no signals through. The electronic screen about our planet permitted no passing wave motion at radio frequencies. With the passing hours, as we slipped through the ether at hundreds of miles per minute, the melancholy within our fleet grew as we became more and more convinced that spaceships from Gamma had overwhelmed our feeble defenses and taken the earth for their own, setting up their radiation-converters and surrounding the globe with an impenetrable wall of massed electrons.

Our velocity was such that, in order to reach the earth safely, the acceleration in the direction of our path was brought to zero and negative acceleration applied. Days later, we were hanging only a few hundred miles above the screen which was now dense, waiting for the attenuation as a bolt would be hurled at us. We would break through the screen at any tenuous point. But we waited in vain, for it seemed the invaders had

read our very thoughts. The screen never lessened in intensity. We tried various rays, but the wall never weakened. We were fighting against overwhelming odds, for the generators of the capturers were fed by cosmic radiations of space, and their source was inexhaustible!

FOR weeks we waited for the ships we could see behind the screens to come out and negotiate, but apparently they were content to keep what they had captured, and we were exiled from our own world. We all hoped that these billions of us left at their mercy on the earth would not be, or had not been wiped out. We wished to help. Our blood boiled at these thoughts, when we considered the injustice of it all, but we were absolutely helpless. It appeared that we had lost our home forever. How thankful we were that everything necessary to a comfortable existence was with us in our fleet!

"Perhaps we had better give up for the present, fellows!" said the dean with tears in his eyes and a lump in his throat. "Perhaps sometime in the future we can better cope with them! This case is hopeless at present, and we can gain nothing. We could not furnish enough ions to combine with the electrons at any point of the screen, for their supply is inexhaustible. Perhaps, in the wonders of this new galaxy we shall find an answer or at least a suggestion as to how we can overcome these ruthless vandals, for, find the answer we must and shall. Once back, we shall see that never again will we be without more than sufficient protection! We can't be blamed for not having left all of our old defenses, because we have had great problems of rehabilitation since we entered this dimension. Let us

venture out into the unknown as we have never before ventured! Let us be guided by circumstances and not pick a goal until we find something of interest to investigate. Let us start a journey into the future!"

Accordingly, numbers were drawn by the six of us, the high number to choose the direction in which we should begin. Vola drew the high and, after trying to decide for some time, pointed to a nebulous little star cluster as the direction. We had no idea of going to it, for it was many light years removed from us, and our voyage was not to consume the period of our lifetimes. We started out at a comfortable acceleration in the neighborhood of five miles an hour per second and drifted noiselessly along at an ever-increasing velocity toward the tiny star cluster.

At the end of the first week our velocity was a thousand miles per second, or over three million miles per hour. Yet there was no suggestion of motion to us, except the effects of constant acceleration, and very slight visible perception of this unmatched velocity, due to the parallax of stars. The astronomers, with their extremely delicate instruments, had no trouble in detecting our speed, however. The first week we were out two hundred and fifty million miles from our earth! An acceleration of such a small figure seems hardly significant until one considers that it is constantly applied for such a long period of time. The second week our velocity had doubled and so had our distance. On and on we rushed through the velvety blackness, paying little heed to the marvels continually unfolded before our almost unseeing eyes, blinded by sorrow. Every now and then some truly wonderful sight would temporarily take our thoughts from our

grief, which was rapidly destroying the buoyant spirits which had launched the armada.

AFTER a few more weeks, at the acceleration we were employing, our velocity was becoming of the order of the velocity of light itself. Some very strange things were happening. Red stars we had been observing ahead of us were becoming yellow, then green and blue in color. Blue stars had disappeared from view entirely!

"No doubt you are all familiar with the Doppler effect," Dean Harvey explained. "You have all experienced it in moving toward a source of sound such as a whistle or a bell. Years ago you noticed that the pitch of the sound became higher when you went in the direction of the source, and that it became lower as you traveled from it. In the first case, more sound waves reached your ear because you were catching up with them, and, when traveling away from the source, you were leaving some of the waves behind. Sound results from the sensation of the ear from waves. The more waves that strike the ear-drum per second, the higher is the pitch. The fewer, the lower it is. This is very noticeable with sound because it travels only about 1,100 feet per second in the medium of air, and normal velocities are an appreciable percentage of the velocity with which sound travels.

"Heretofore, we have never attained velocities high enough to noticeably change the number of light-waves reaching our eyes in a second, an enormous number for the entire visible spectrum. But this same effect must hold true for any wave motion. The velocity of light, according to Einstein, is constant in any given medium,

and independent of the velocity of the source. Now that we are traveling about 60,000 miles in a single second, or roughly a third of the velocity of light in a vacuum, which we ourselves are now in, the effect becomes very marked. In a few days something very startling will happen!"

And it did. Blue stars behind us were given off light of a color decreasing in frequency, for, at our stupendous velocity, the light waves were falling behind, and we did not receive as many per second on our retinas. The stars ahead were fast disappearing entirely! All was becoming so black that it seemed we were going to strike a solid wall.

Under our acceleration, as our velocity approached that of light itself, the stars behind us were gone. Only heat radiations, immediately below the red, visible radiation, the infrared, reached us. Ahead, the light was approaching the field of the lower order of X-rays. To say that all of the stellar bodies were now invisible would be untrue in part. To our instruments, sensitive to bands higher in frequencies than our eyes were sensitive to, and lower in frequency, they were there, as definitely as if we could actually see them.

Pearson had become very anxious and fidgety. He had been smoking almost continually for many hours, as he nervously watched the velocity indicator. I knew what was worrying him, and I knew he could not contain himself much longer.

"Worried about your length?" I asked. "The Lorenz-Fitzgerald formula says that we are practically nonexistent now!"

"I know all of that!" he returned. "Aren't you going to decelerate very soon?"

"Not at all!" said Kroelich. This

answer did not help the composure of poor Pearson. "We are going to exceed the velocity of light! It is no hoodoo figure beyond which there is no going! No need to worry about your length after that, for we cannot take the square root of a negative quantity, such as results from direct substitution in the formula."

"We just simply are not, now!" I teased as the indicator rose to 190,000 miles per second!

THE teasing was soon forgotten as we were struck with the realization of what we had done. We had exceeded the velocity of light! To us, the contraction of our ships, bodies, everything, had not been perceptible, even to our other ships, though it must have occurred. The condition in which we now were had no explanation. Even the dean had nothing at all to say.

Peculiar things were becoming visible in the form of rosy patches ahead of us.

"Easily explained this time, folks," said our chief explainer, the dean. "If the stars behind us passed into invisibility because they were only heat rays to us, wouldn't you expect heat rays to become visible ahead of us as enough waves reach our eyes to bring the sensation into the visible spectrum? These patches are the heat radiations of the stars which disappeared from view!"

It was truly wonderful, and the effects were still more wonderful as we traveled on at velocities several times that of light itself.

After a few weeks, some strange substance was detected hundreds of billions of miles before us, strange substances which gave indications of being something entirely new to us. Accordingly, we went through the

point of zero acceleration and then decelerated for months until our velocity was but a hundred thousand miles per hour. All of the strange phenomena had reversed themselves as we decreased our velocity gradually. The strange bodies before us were becoming visible through the telescopes, peculiar masses of tenuous, yet reflecting stuff.

"I believe we are about to receive another great surprise," commented the dean. "There is no end of wonders in space, but this will be something so different, that, like the little source of energy we saw, we shall have great difficulty in defining it!"

It was not many days until we were very close to the first of the masses of strange stuff. It defied every attempt at analysis, yet, there it was, apparently drifting about in the utter void. There was a peculiar luminosity of the material itself, which made it plainly visible. It covered so many myriads of miles that we could see no limit to its extent as we came within a few millions of miles of it. In some places it seemed to be crystalline in structure, for we could clearly see facets. It ranged in color through the entire visible spectrum. It seemed to have no real mass, for we could measure attractions to within a very small part of a millionth of a gram, and, knowing our distance from it, and our own mass, we should have been able to measure the pull of such an apparent bulk of matter.

As we continued to lessen our velocity and came ever nearer, we were sure that this structure was almost entirely crystalline. It was a thing of extreme beauty, too. The dean had been busy measuring the radiations from it, and he declared that never before had he imagined that anything could furnish all of the higher known

radiations including cosmic rays, and some apparently of still greater frequency, beyond the range of our instruments. He was very much excited, as were all of us now, for here was something strange and fascinating indeed! Something with great bulk, no mass, a crystalline structure, and an almost perfect radiator.

THEN came a very strange feeling, a feeling as though some presence was making itself known to us. This something was working into our minds, and we felt that everything was being read. Here was something out of the realms of science, something unfathomable! We continued on, for we felt that it was wished that we do so!

We were now so near that we could plainly see that the structure was covered with cavernous openings, openings so large that our fleet could sail into any one of them in regular formation, with plenty of clearance to spare. We wanted to enter, and it seemed that our wishes were granted before we had finished thinking them. The fleet glided, at very low velocity, into a rosy-hued cavern of enormous proportions. This cavern seemed without end, and it was clearly illuminated by visible radiations from all of the walls. The colors changed as we continued on, fascinated by the delicate structures of spires and steeples, much like the formations found in some of the caves on the earth. Yet, all of these were regular, hexagonal crystals, arranged with mathematical precision.

The colors not only varied with certain portions of the tunnel, but changed slowly in any one spot as we watched. The beauty of it all was so exquisite that it was beyond words to describe. Never before had we seen

anything so strange nor so utterly wonderful. Our minds were soothed, and we could think of nothing else save the quieting influence which had come upon us like a healing salve. We did little talking, for it seemed that talking broke an almost holy stillness. Here was rest and peace and comfort, such as we had never dreamed of before. The ships themselves had acquired a luminous glow, we found. The ever-changing walls never tired us as we kept watching them, and contentment seemed settling more and more upon us. If only we could live in a glorious realm such as this! Yet, it was so tenuous, all of it, that, as matter goes, it had no mass, no substance at all. Still, there it was, radiating something even beyond known radiations, something of the order of intelligence! The thing was sentient, without a doubt. Perhaps it was mind, and mind alone, shaping itself visibly into gorgeously colored figures. I mentioned that it was a giant radiator, but the dean found no radiations below visible red. There was no extension into the infra-red region, and the temperature within this whole thing was absolute zero!

THE cavern was still widening after days of cruising through the wonders. It was now widening very rapidly, and, just as we wondered what was to come next, we sailed out into a hall of such vast proportions that it seemed as limitless as the void we had traversed. Yet we knew the whole was encompassed by the crystalline structure. We had marvelled at the beauty and strangeness of what we had seen in the past few days, but we were struck utterly speechless by what we saw now.

This entire cavern was a misty swirl of almost transparent vapor,

scintillating and shimmering with every color and mixture of colors. The delicacy and weirdness of it were lost on such tiny minds as ours as we gazed enraptured, overwhelmed by the sight about us. We were entirely incapable of appreciation since this so far transcended anything we had ever seen before. My head felt as though bands were withholding my mind from grasping what I saw about me.

Here and there nebulous forms drifted, ever changing in size, color and shape. Somehow, there seemed to be perfect harmony here amidst the apparent chaos. I heard, or thought I heard gentle whisperings and delicate musical notes, so very soft that they were hardly distinguishable. Probably I did not hear them at all, but, since the sensation of hearing depends on the brain impression, the results were the same. Here we felt more than ever the searching waves which were reading our every past thought. I was thinking of things long forgotten, thinking with extreme rapidity, and this omnipotent power of mind was forcing me to do it and absorbing all of it. I often think now that we should have been entirely frightened and of how foolish we had been for entering the cavern, for we were utterly helpless. However, at the time, we could heed only the guidance, for we were bereft of the power of independent thought and action. It seemed only for good, so that we went ahead to see wonders which were almost worth life itself.

Our fleet had come to a standstill well within the vast hall. The shimmering of the filmy vapors was pierced now and then with bright little darts of color which flitted about seemingly with no particular objective. Several times we saw smaller opalescent spheres undulating to an

unheard rhythm. The silvery musical notes within our brains were growing louder and more insistent.

Suddenly they stopped entirely, and the entire cavern was lighted by an eerie violet glow. Millions upon millions of undulating spheres, all pearly and beautiful beyond description, became visible as the misty veil was dispersed by the new radiation. We were being questioned by the unseen power of mind. Whence had we come, where had we been, whither were we bound? The answers were absorbed from our minds the moment we thought them. Particularly did the mysterious power dwell on the latest catastrophe, the capture of our earth. A note of sadness could be felt, but, immediately, it was followed by a great wave of happiness and joy, as the spheres vibrated much more rapidly. Would we stay forever within this hall? We were welcome visitors, and, since we had lost our old home, we should remain there with nothing but sublime happiness and joy ruling always!

Not one of us but would have assented readily, had he been free to do so. We told the unseen power that we felt it our duty to save our earth from the marauders who had so ruthlessly captured it from us in our short absence. We told the power that we had been unable to think of any means of saving it, and that we might remain for some time within the fairy caverns until we could devise some means of offense which would be effective against the electronic screen.

ANOTHER note of sadness was impressed upon us, and then, with many inharmonious tinkles, we felt that a discussion or even an argument was going on within the mind itself. But gradually the discords disappeared from our brains and only

soft notes of happiness came to us. The spheres were undulating very slowly now. This power would be glad to help us when we wished to return to our own system. I could well imagine that this mind could rule practically anything it wished. Without material violence it could persuade almost any sentient being to do its will, had it chosen to do so.

The violet glow was fading and the spheres were becoming less distinct as the veil returned, and the tiny darts of light once more began playing about. We found ourselves turning about and retracing our way through the monstrous cave. We felt sure that we had secured the aid of this strange paradox, yet we knew not how we would be helped.

Days later the fleet of twenty earth space-ships emerged from the entrance, and, lo and behold, we were completely enveloped in a massive formation, absolutely transparent, yet we could see its changing colors wavering about us. For weeks and weeks we accelerated. We reached the velocity of light, but nothing happened to our strange envelope. We exceeded the velocity of light, but still our guest remained indifferent. The phenomena we had seen on our outward journey were repeated. With half of our journey completed, we decelerated. The feeling of happiness remained with us, seemingly with the same intensity in which it had existed within the hall. How this substance and its guiding mind were to help us, I could not imagine, nor could any of our party, but we were confident of the outcome nevertheless. There was no manner in which to deny the persuasion of this mysterious something clinging to us!

Our earth was once again visible through our telescopes. Instruments

showed that the foreign electronic armor was still in existence. As we drew nearer, it increased in intensity, for our arrival was fully anticipated, though we wondered what the enemy thought as they saw the fleet approaching with a massive crystalline structure about it. Perhaps they imagined we had been absorbed by some other enemy, who, in turn, forced us to return to our world which they might intend to capture. Great fear was evident, for giant destructive rays were turned upon us while we were still well out of range. The intelligence was impressed upon us that we should not use any offensive weapons or any protective screens, since their use was unnecessary! We had been very confident while under the influence of this master mind, but we had our misgivings as we came ever nearer the blazing electron screen and within range of the terrible destructive rays. We obeyed instructions, however, and waited to see what would happen. I noticed that our operators were prepared to snap on our ion screen in an instant should anything happen, and I believe that we all expected to find their use necessary.

With startled expressions of faces we looked at each other as we passed directly through the path of a beam fed by cosmic radiation and nothing happened. It was even more startling to the attackers, for the number and intensity of the rays increased. We were bathed in eerie light, as the mass about us merely seemed to dissipate the radiations as phosphorescence, and the soft melodious notes continued on in our minds, unabated.

WE were on the skirt of the shimmering blue electronic screen! It seemed impenetrable as always, but

with no effect upon us whatsoever, we started through it, and soon the features of the globe were entirely distinct to the naked eye. All of the generators supplying the enemy screen were switched to the death-dealing ray converters, for the screen, having failed to keep us out, was useless now. The radiations striking us might easily have broken down our full intensity ion-armor had we had it up, but the tinkling notes continued as if nothing were happening. How anything, material or otherwise, could withstand and absorb a bombardment of so many quintillions of kilowatts none of us will never understand as long as he or she lives!

Without hesitation, we made directly for the central city of the world whence we had departed months before. I wondered then what our fellow men thought as we came nearer the earth and to the landing field which marked the start of our cruise. Did they think we had been captured by a more terrible adversary even than theirs?

The bombardment of enemy rays never diminished. Suddenly the tinkling became a chaos of sound, not loud, but excited and mixed with many discords. The entire mass was becoming amorphous and melting from our fleet, rolling along the ground much as molten lava. Tiny incandescent sparkling points appeared over the mass until it seemed to be a terrifically hot mass of melted metal. One by one the rays of the marauders ceased, and, as the substance spread and grew enormously, the sounds in our minds became fainter and fainter.

Then the first enemy stronghold was reached. The amorphous stuff seemed to swell and ooze over it. For a few moments we could see crystal-

line structures reappearing in all of their beauty, but the mass again melted and rolled on. Our bewildered eyes beheld nothing but bare earth where the enemy stronghold had been. Yet some of our own men ran directly from the stuff, insane with fear, but absolutely unharmed.

When we saw what was happening, we quickly opened the ports and descended to the earth which lent a most welcome feel to our feet. We were home, and our homeland was being miraculously restored to us. Enemy cruisers were being dissolved before our very eyes as the substance, if it could be called that, spread and grew and grew. It seemed to have no limitation to its volume, and in a few short hours, it was on its way to cover the whole of the earth's surface. It selected only the foreign invaders and their machines and space-ships. Men and women of our world might be intermingled, but they were never so much as scratched.

IN two weeks the mind in material form had returned to its former size and had gathered itself into lofty hexagonal pinnacles of all rainbow colors on the outskirts of the city. The spires, highly illuminated, reached miles into the sky, and caverns of exquisite beauty opened throughout it. For weeks those who had remained behind on the earth when the fleet left, were taken into a small replica of the hall in which we had been.

But after these few weeks, during which we hoped that the crystalline structure would remain forever with us, the tinkling notes told us they would leave us to return to their space-home. We tried to thank them, but the notes that resounded in our brains were like fairy laughter. They

were those of happiness after having brought happiness to others. They did impress on our minds that they could not reason why we preferred our earth to the fairyland home they had offered us.

Gradually the colors became less distinct and the spires melted into thin air. With a sudden shrinking, the whole mass became a brilliant spot of light no larger than a foot in diameter. For only the twinkling of an eye it remained stationary, then, with inconceivable velocity it suddenly streaked into the atmosphere toward the void. All that remained were a few wisps of luminous vapor which fast melted into nothing. Our minds no longer heard the soft notes, and we felt the loss of the influence. Though we were elated, now that once more the earth was free, try as we would, we could not keep a sadness from entering within us!

It is time that we had Calloway's story. He had remained on the earth when the fleet had left the second time, in charge of the affairs of Beam Transmission, Inc. From him we learned about the invasion of the earth from the planet Gamma soon after we had left the latter after our interesting experience with the thunderbolts. Had we broken through their screen when the bunches of electrons were being hurled at us, we could have annihilated the entire population, and the invasion which occurred would never have been.

The few generators which could be mustered into service had withstood the electronic bombardment for a surprisingly long time, but the overtaxed atomic generators failed one by one as tons of water molecules were formed, dropping as mist, fog and even rain upon the surface of the earth. Soon a hundred great dread-

naughts of space landed and took complete possession of everything. The most astounding thing was the description of the appearance of the capturers.

Perhaps we should not have been so surprised to learn that in evolution in this system, chance had elevated an ant or a reptile or some other familiar animal to the position of highest intelligence. But we were completely at a loss when we learned that the things which had landed were queer ring-shaped things of white metallic lustre, who had within themselves the power of remaining suspended from the surface of the earth. They had no separate heads which could be discerned, but there was an opening which served for an entrance for food, which seemed to be any metal or metallic compound. Their metabolism and associated anabolism and catabolism were so different from our own that it seemed almost unbelievable.

NATURALLY enough, everyone had resisted the invasion. It seemed that it would be a simple thing to destroy these queer beings once they were out of their space-ships, but results proved otherwise. Apparently these invaders from Gamma produced an invisible field about themselves which made hand ray-pistols entirely ineffective. When solid bullets were tried they went just so far and then were flattened as though an actual wall surrounded these metallic-looking animated rings. Even clubs were tried, but, either they splintered against this unseen aura, or the wielders were suddenly paralyzed into inaction. After a few seconds they would be released, and they remained free just so long as they resorted to no violence.

The dean wagged his head and then expostulated.

"After having gone through what we have, can you men truthfully say that you are surprised to learn that we have made the acquaintance of a new intelligent being, which utilizes another chemical action to produce motion and body functions? Why not derive energy from an acid reaction on a metal or a metallic salt? I have always considered it a slight that we were endowed with such critical systems which require organic compounds for food, and needed to maintain a definite body temperature. I should call it grossly inefficient. They can have no diseases since they are not organic, and their waste products are simple chemical compounds and elementary gases.

"This matter of remaining suspended against the attraction of gravity is not so remarkable when you realize that we did exactly the same thing with our own space-ships! We employ repulsive rays which act against gravity's force and thus equalize it, or overcome it to such an extent that we can rise directly from the earth, or other planetary body, at great velocities."

These metal beings had not molested the population to any great degree, but they let it be known that they were the masters, and their inquisitiveness was not satisfied until they, with their many tiny appendages about their ringed bodies, operated the controls of all of the beam transmission stations. They gloated over the power within their grasp, and it appeared that beam transmission was entirely new to them. They grasped the science involved almost immediately, however, and, from then on, they merely played a big game in directing everything. Their food was

everywhere, and these creatures seemed not to enjoy eating a meal. It was merely a necessity to them and their existence, and they treated it only as such.

Whether or not the earthmen had been mistreated, the feeling that a foreign race was dominant and had set up its rule with its offensive and defensive weapons was highly undesirable. With great rapidity these strange forms had installed their cosmic ray converters to armor the earth with an electronic wall. No doubt they knew not when the fleet would return, and they wasted no time in preventing its successful entry to its home planet. Their past experience must have told them that the armada was a thing of terrible power.

Needless to say, the main subject of conversation for many months was the mass-less, substance-less mind in apparently physical form which had been our means of salvation. The question will never be answered, but neither will the strange aid ever be forgotten.

Since there was no mass to the stuff, and it never varied in temperature from that of the ambient medium, Pearson, as well as some others, argued that all of the impressions had been mental, and we could not have done otherwise than imagine all we had seen. So strong is the power of suggestion that such a thing might be true through a form of mass hypnotism. I cannot see it exactly as such, but everyone is agreed that, whatever form it had assumed, we had been within the influence of an isolated region of pure mind or intelligence. Somewhere, somehow, evolution had extended so far as to make mind independent of a physical form.

No wonder, in the light of all of our strange adventures, we were looking

forward to another voyage into the unknown, almost before we had had time to think over what we had experienced in our first exciting cruises, and if what we had seen was any criterion of what was to come, we could not be blamed in the least!

This time Pearson was the first to suggest it, and we all laughed. But before all of this high adventure, we must build up our earthly fortifications, for it might come to pass, in

this new dimension, that some power might capture our earth while we were cruising about in the void, and we should remain forever without a planet. Whether or not the earth was necessary to us had to be decided, and regardless of scientific achievements, there is always a sentimental attachment for the old, much as we prize the new. The human mind does not change as rapidly as the things controlled by it.

THE END

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Crawling Terrors

By EDMUND SCHUELER

This is a story telling of a proposed vengeance upon mankind by one who has been wrongfully convicted of a crime.

THE turnkey walked down the long stone corridor, and stopped at a cell, comparing its number with that on a card he carried. Save for that number it could have been any of fifty in the somber, gray tier. He opened the door.

"Warden wants you right away in the office," he announced. "Don't bother to tidy up; just come along."

The prisoner preceded him down the hall. He was a lean man of about middle age, tall, and slightly stooped. The gray prison uniform seemed, if anything, to accentuate his gauntness. A high forehead and piercing brown eyes helped to convey a subtle but definite impression that here was no ordinary convict. The face indicated a man of above average intelligence, lined, but far from broken in spirit by confinement.

"Good morning, Doctor," the warden greeted. At the title the brown eyes snapped down from the window, and seemed to drill into the other's face.

"Forgotten my number, Warden?" A cultured voice originally, it was now rasping, and carried a sneer.

"Not likely, I'll tell you. I have a letter for you from the governor, brought in just now by messenger. Here." He handed the sheet across the desk.

As the prisoner read, astonishment, then the sneer, showed on his face. In the letter were included the paragraphs:

"The State of New York has unearthed proof that your incarceration on the charge of manslaughter was the result of one of those costly miscarriages of justice sometimes impossible to avoid. I realize that three years is an irreparable loss from the life of an innocent man, and I regret that there is no suitable compensation I can make. Any reasonable material claim you may file will be carefully considered, I assure you.

"At present, all I can offer is a sincere apology on behalf of the people of this commonwealth. Your release, of course, is to be effected immediately."

More in the same vein followed. The prisoner glanced over it carelessly. He turned on the warden bitterly.

"It's about time! Three years in this hole for somebody's whim. And they 'apologize'!"

The warden looked at the ceiling. "Why take it out on me? You've made trouble enough while you've been here . . . I'll get you off on the noon train, if you wish."

THAT afternoon Carlos Beeman, M. D., wandered about the city, renewing his contacts with a life lost for three years. Sullenly he renewed a



"Pretty, isn't he?" Hillegeist asked with a crooked grin. "They're what you asked for."

long-standing vow of vengeance against a fallible mankind—because he had been singled out as a victim of one of its errors.

"I'll finish 'em one and all—and it won't be a 'mistake', either!" he averred.

Alone in the world, he was at least fortunate in not having to worry about money matters. His moderate wealth would have been sufficient to maintain him in comparative luxury, had he so desired; but more important to him, it would finance the greater part of a hellish design that was fomenting in his brilliant, if distorted brain, despite the golden glory of the warm spring day.

He had but one friend, to his knowledge, in the person of a former fellow-prisoner—an entomologist—likewise embittered against humanity, with less reason, for his guilt was admitted. Between them there had grown up a friendship of the closest sort possible to such individualists. By a coincidence, only a month would elapse before Marc Hillegeist would be released.

During the next few weeks Beeman set about making some preliminary studies, and settling the details of a long-term lease on a small, uninhabited island off the coast of French Guiana—in the same group with the infamous Devil's Island of real and fictional horror.

He wrote to Hillegeist at the prison, and arranged to meet him on the day of his release. For the prison censors he phrased the letter to give the impression that he was suggesting that together they go to a distant part of the country and begin anew. The reply indicated that the arrangement was satisfactory.

Hillegeist was a stocky man, younger than Beeman, with a

tangled mane of black hair on his large head, and beetling brows jutting out over pig-like eyes, distorted by thick glasses. A former state entomologist, he had been unable to resist the lure of public funds in the days before civic expenditures were so carefully audited—even though rather plentifully supplied with the world's goods himself.

Now he was leaving the gate, with never a look behind.

"Hello, Beema'n," he said dully, his watery eyes blinking in the noon-day sun.

"Get in and listen. I understand how you feel." They drove away in the small car that Beeman had provided.

Before the plan was half explained to Hillegeist the little man's eyes were alight with unholy glee. He nodded agreement vigorously.

"There are several members of the family we might be able to use," he stated, with more enthusiasm than Beeman had ever remembered hearing from him. "For example, we could start with the largest of them all—the South American tarantula we call '*Theridon tepidariorum*,' if I remember correctly. The body is about three inches long, and the spread about the size of your hand. Quite savage, but not particularly venomous. The creatures sometimes live fifteen years, and continue growing most of that time."

"Splendid. The work with them will be your job at first. For a while after we arrive I expect to be busy making contacts at the prison hospital."

They were nearing the city by this time. Beeman drove with a vicious disregard for the rights and safety of everyone else on the road.

"But how about finances?" Hille-

geist shivered slightly as he mentioned the word.

"Between the two of us—yes, I've already looked up your standing—we can swing it." Beeman's tone indicated that the pooling of their resources was understood.

"Done," Hillegeist agreed. "Now about the materials I'll need—"

THE small island of Les Desolées was singularly barren of vegetation in the midst of such tropical verdure. Rocky and almost treeless save for some scrubby palms in its northern valley, it supported practically no animal life, until the coming of Beeman and Hillegeist. Its rocky spine rose in a peak near its center towering aloft with a dead volcano, brown and forbidding. From the summit it was possible to see, on clear days, the mainland at Tonat, some twenty miles to the west.

During a time of three months Beeman and Hillegeist, with Carey Winslow, a young engineer and jack-of-all-trades recruited from a New York headline, supervised the native labor in the erection of several low buildings to house the power plant, laboratories, refrigerators, and living quarters.

Winslow had asked no questions. A job was a job to him at that time, and he had accepted it gladly. The indications were all in favor of another series of earnest, if impracticable scientific investigations. Later, after the first shock of discovery, he had gradually become used to the idea. What did it matter, after all? He owed the world nothing.

A silent Chinese, perhaps lately off some tramp steamer, was engaged to look after the cooking and other domestic matters. These four made up the island's population.

Hillegeist was most concerned about the ultra-violet ray apparatus, with some modifications introduced by himself and Winslow. For a month he did little more than study its construction and operation. Finally he announced that he was ready to go ahead.

Beeman, in the meanwhile, had been making numerous trips, some of them overnight, to the near-by prison colony.

"I've been making myself friendly with the hospital staff up there," he reported to Hillegeist. "They were glad to get my services—they're always short of help at that hellish place—and soon I'll have access to what I'll need . . . Here are a dozen of the tarantulas you wanted. Several pairs among them, I believe." He produced a cardboard box perforated at several points.

Hillegeist shook the box tentatively, and a soft, scuffling sound came from within.

"The males probably eaten by now," he observed. "A nasty habit they have. I'll examine them right away." He crossed to his laboratory.

He was back in a few minutes. "Two of the males are still alive, thanks to luck. And six females. We've enough for a start."

Keeping the big spiders segregated in wire cages and collecting bugs, small snakes and rodents with which to feed them, occupied most of Winslow's time until he devised a snare with a brilliant light-bulb to attract insects. Placed in a damp spot in the island's valley, it was filled to overflowing every morning.

As soon as the first eggs were produced Hillegeist started the violet ray apparatus, and subjected samples of them to it for several hours each day. Impatiently he waited to learn

if the modified rays had heightened the normal effect of the light without causing the mutations that might be expected to result had they used the stronger X-ray.

The first spiderlings hatched much the same as ever. They grew very rapidly, but at the end of several months were little or no improvement over the originals, as far as size was concerned. But the startling speed of growth was encouraging, and he kept at the project.

In the meantime other lots of eggs were kept at varying degrees of cold in the refrigerating apparatus, and their hatching time retarded—always being subjected to the rays. Almost from the start, these young fry showed promise of developing to greater size.

Hillegeist had no intention of waiting years for the tarantulas to attain their full growth. The action of the rays on the youngsters was speeding up the process of development until he could produce five complete generations in a year, with each showing corresponding increases in size.

By now scarcely a week passed without additions to the cages. Hillegeist learned that keeping the eggs just above the freezing point would delay incubation longest, and produce the greatest number of oversize spiderlings. Below that temperature most of the eggs died.

Through a process of selection he worked over them, and kept only the largest individuals of each lot. The small ones he fed to their loathesome descendants. The original supply had long ago been killed, and fed to the current breeding group.

Hillegeist was certainly producing results, as measured by size alone.

"A beauty, eh?" he asked Beeman

one day, pointing to a cage containing a tawny, crawling beast a good seven inches in diameter. "Only the fifth generation, and that much development already."

"Fair." Beeman's laconic reply only thinly masked the jealousy he felt for Hillegeist's success. In truth, he had not paid particular attention to the spider Hillegeist had exhibited. They were both working for the same cause, of course, but—

Before embarking on the project Beeman had carefully studied all the available literature on the subject of the classical Rochester experiment—that of keeping a section of chicken heart alive and growing for years in the proper solutions and temperature.

AT the prison hospital he had chiefly concerned himself with the surgical processes involving work on brain tissue. Plenty of these cases were available, as a result of lax guarding of the prisoners. They were free to do as they pleased, and violence was frequently in order. Beeman's status at the institution put him in a position to help himself on several occasions, to bits of brain tissue; these he carefully carried back to their island.

To date he had not been able to duplicate the Rochester results, and hence his pique at the success Hillegeist had already attained.

With the manner of idly discussing with a fellow-surgeon the possibility of keeping a section of human brain alive, he outlined, as a hypothetical case, the procedure he had been using.

"Interesting subject, I'd say," his colleague remarked. "But were I doing something of the sort I'd start with natural lymphatic fluids and

varying amounts of human blood—assuming, of course, that they were available.”

Beeman laughed. “A possibility, you agree. But for all that, neither here nor there. Getting around to more practical things, Doctor, how is your quinine synthesis proceeding? Ready to startle the world yet?”

“Hardly,” the other confessed dryly. “But a really good one’s bound to come, sometime. Perhaps I’ll be lucky.”

The first suggestion had set Beeman to thinking. Simple as it was, he had overlooked it; he had not seen the forest for the trees. He saw to it that day that the vital fluids named were available, and hurried back to the island to begin a new series of experiments with them instead of the chemical solutions he had been using.

This time he succeeded. The tissues lived and grew. Also, he was able to get growths from different brain areas, recognized as governing various phases of human activity.

His next problem was to join a section from each into a unit having the several characteristics he desired to combine under one “roof.” In so working he used up almost his entire supply of tissue, and on several occasions he was delayed a matter of days at a stretch, while he waited for more of a particular type of cell to grow from his stock.

At length, after nearly a year of endeavor, having produced what he hoped to be a synthetic brain, small enough for the graft he was contemplating, he watched it almost ceaselessly for weeks, scarcely stopping to eat or sleep.

To his untold satisfaction it grew, makeshift though it was, and he care-

fully pared off the faster-growing cells to keep the proper balance.

He built up a number of these, and kept each incubating in its own small jar. He had learned, fortunately for his more extended experiments, that sea-water could be substituted for the lymph, after the cells had begun to grow. Even the amount of blood necessary could be cut down to a fraction of what he had used at first. These finds made it unnecessary for him to visit the prison hospital except at rare intervals.

During this time he paid little attention to Hillegeist’s work, beyond listening to the latter’s assurances that it was progressing faster all the time. Both of the conspirators were far from talkative about their plans and activities, and each had drawn into his own shell until the time should come for them to unite the products of their skill.

Of late Hillegeist and Winslow had been treating their repulsive charges to frequent periods of cold to strengthen them for their intended purpose. Freezing temperatures made them sluggish for a while, but obviously did not harm them permanently in any way.

“Just as I’d hoped, after incubating them in the cold,” Hillegeist observed to his assistant.

By now only the very largest among them were being kept. The ray treatment was working well enough to specialize on a few, rather than to depend on heredity to enlarge one accidentally among thousands of eggs.

“Tomorrow I’d like to have a pair of your large specimens,” Beeman informed Hillegeist one night. “Not the best, because the first experiment probably will not be a complete success, but creatures large enough to

work with." Hillegeist agreed to deliver them the next morning. "We're ready for the second step," Beeman announced with gravity.

By his failure to observe Hillegeist's work more closely, Beeman was totally unprepared for the next morning's development. Winslow and Hillegeist entered his laboratory, each carrying a glass cage about the size of a suitcase.

"But I wanted only two of those animals," Beeman protested in some exasperation.

Hillegeist said nothing. With a gesture of triumph he drew back a slide on one of the cages. Beeman peered through the wire grating, and shivered in genuine horror.

"Ugh!" he exclaimed. The hideous brown thing behind the screen had a bulbous body at least ten inches long, and a spread of more than a foot and a half. Its hairy legs were thick as Beeman's thumb. Baleful orange eyes glowed in the semi-darkness, as the monster sidled about restlessly.

"Pretty, isn't he?" Hillegeist asked with a crooked grin. "They're what you asked for. They weigh more than four pounds apiece. This one's slightly larger." He opened the other slide, and another set of sinister eyes leered out. To Beeman it seemed as if they were focused on him alone.

"Don't worry about killing 'em," Hillegeist continued. "We can get plenty more."

THE work of that day tried the morale of Beeman as nothing in his previous experience had ever done. Sheer terror gave way to disgust and loathing in turn. Darkness was approaching when he lifted the drugged monsters back into their cages. Even yet, the touch of their

soft, furry bodies against his bare arm above the rubber glove, and the twitching legs sent chills over him. But it was nothing, compared with the feeling of utter revulsion he had experienced in the morning when his scapel bit into the first ugly head . . .

Unable to control the trembling of his hands, Beeman had bungled this first attempt, and the big male was dead the next morning. The female lived, although in a state of paralysis.

Several more trials convinced him of the futility of trying to unite tissues of such different natures. Again he was approaching discouragement.

In the meantime, Hillegeist had reduced the egg size until it was scarcely larger than with the original insects. The number was correspondingly increased by careful selection and breeding, and the largest did not exceed a sixteenth of an inch in diameter. Once incubated, however, the savage creatures grew astonishingly fast. A few months found them developed to practically full size. Better still for the plan, the ray treatment and stimulus became less and less necessary until finally it was abandoned altogether.

Another idea occurred to Beeman one day as he watched one of the creatures with an unusually large head. A tropical fly walked about in front of the tarantula, and yet the animal made no attempt at a capture. Perhaps the smallness of the prey was the reason, or, as it seemed more likely to Beeman, the enlarged brain had been dulled by too-rapid development. He knew that, aside from the sloths and some of the larger serpents, natural laziness is practically unknown to tropic animals. In an endeavor to bring about

a change he resolved to try an entire transplantation, instead of continuing his attempts to make a workable graft.

His fourth trial at the new venture promised at least some measure of success. The tarantula lived, and showed none of the sluggish traits that had marked the later broods of Hillegeist's beasts. A few days after the operation the creature exhibited astounding energy, and for sheer savagery was the reincarnation of the devil himself. It would attack anything that moved—not in a haphazard, rough-and-tumble way, but only after obvious consideration of the means, and the procedure most likely to be successful.

ONE afternoon Winslow summoned Beeman and Hillegeist to the compound.

"Listen," he directed, "and tell me if I'm imagining things."

They listened. From the gaping jaws of the vicious one there issued at intervals a succession of sounds grading from hisses to throaty growls.

Beeman hazarded an explanation. "I must have included part of a speech center in the brain I gave it," he said. "Allowed to develop, the things in time probably will evolve some sort of larynx." He listened again, and added: "They'll need it, eventually, I don't doubt."

Nevertheless the effect of the eerie and unearthly noises could be noticed in the faces of all three. It was as if for the first time they realized the degree to which they had perverted the laws of Nature.

Fighting was resumed among the creatures in their wire cages by this new stimulus; again it was necessary to keep them in separate pens.

For a time they had shown more or less indifference to the presence of others of their own kind, but now the smouldering fires of natural hate in them had been rekindled by the cunning attacks of Beeman's newest product.

He selected several of the most ferocious among them for other transplanting studies. By now his technique and skill had advanced to the point where he could be reasonably sure of success in almost every case.

It remained to be seen whether the succeeding generation would inherit the new characteristics, or whether additional selection would be necessary. For several months Beeman had little or no work of his own to do. To vary the monotony he spent much of his time at the hospital, and there built up quite a reputation as a surgeon skilled in almost any work requiring an exceptionally delicate handling. He won the admiration, if not the friendship of the surgical staff, who were quick to recognize the man's rare combination of genius and plodding attention to detail.

It became evident that Beeman's attainments with the great tarantulas would be carried over into the succeeding generation. From among the hundreds of spiderlings, he chose ten at random and removed the brain from each. Even in that undeveloped condition they showed him plainly that in four cases the transplanted form had been transmitted. They were better than his original specimens, since the forces of heredity had acted to fill the entire cranial cavity without the use of dummy tissue, which Beeman had been forced to use. The size of the spiders was not impaired to any noticeable degree.

From among these the most savage

were selected to carry on the species. It appeared, too, that the members of this group were endowed with the greatest intelligence.

By the time the third generation had hatched and shown even higher developed mentality, Beeman was convinced that his share of the work was completed. The rest was up to Hillegeist.

"Select them now to produce the greatest number of eggs," he directed his henchman, "and then we will be ready for the final step."

Another significant development showed in the latest brood, in that, although they would readily attack any living thing, from man down, that came within their range, they ceased to fight among themselves. This simplified the problem of caring for so many, since they could be impounded together again. They would congregate in sinister groups, as if already some understanding had sprung up among them; as if they were *planning*, and waiting for a chance to escape and conquer these Man-Things who had brought them into being. They could be handled only with the greatest caution.

FOUR years had been expended in bringing the plot to this stage of perfection. The major problems were solved, and not any too soon. Although after the original installation, practically their only sources of expense had been gasoline for the power plant and launch, food for themselves, and the small salaries paid Winslow and the Chinese—why, the former could not imagine—the total included almost all their resources.

Two more selections solved the quantity egg-production problem. Each pair could now supply from

five hundred to a thousand eggs at intervals of three months, and among test lots scarcely ever was a spiderling found to be a throwback to the original unintelligent stage.

At a temperature slightly below the freezing point, Hillegeist already had learned the current type of eggs could be kept indefinitely, and that they did not die, as formerly. He was collecting them as fast as they became available, and in the meantime was affording the beasts as much opportunity as possible for them to associate with themselves and learn . . .

One day Winslow rushed into Hillegeist's laboratory, where the entomologist was discussing with Beeman their final plans, with the news that they were about to receive a visitor. A man in a small boat was approaching, he announced.

"Go down and wave him away," Beeman ordered sharply. "No, wait. Let him land, and we'll keep him from coming up here. We can't afford to build up any mystery about the place."

The visitor was one of Beeman's fellow-surgeons from the penal colony.

"Hello," he hailed. "Thought I'd drop in and see you." He was one of the younger staff members, and a confessed admirer of Beeman. "I imagined you were doing something worthwhile down here, and I'm naturally curious . . . Mind showing me around—or is it secret?"

Beeman was more than disconcerted. Discovery would mean the failure of their plans. Furthermore, they could not keep young Dr. Hanback a prisoner for any length of time. It was a critical situation.

"Why—glad to have you, of course, Doctor." Beeman's forced smile bare-

ly hid his annoyance. As a last hope he clung to the idea of carrying off the explanation as a harmless zoological experiment, and pledging Hanback to secrecy.

"What brought you here today?" he asked curiously.

"I'm taking leave of absence—rather suddenly—and was heading for Tonat when I decided to stop off on the way. My luggage is in the boat."

Beeman allowed himself the luxury of a genuine smile. This was different. The young innocent had played right into their hands.

They walked up from the landing, and Hanback babbled volubly about an unusual case he had helped dispose of that morning.

"A prisoner, trying to escape, fell in with a crocodile, poor devil. By the time we got him—" He went on to describe the gory details, and outline the unorthodox surgery used successfully in saving the victim's life.

Ordinarily Beeman would have been deeply interested—from the standpoint of science, rather than in the fact that a human life had been spared. Now he was both bored at the recital and angered at the intrusion.

"Over here we keep some of the products of our little whims," he remarked casually. "Now in that compound there—"

Hanback was rubbing his eyes frantically, as if to clear them of some nightmare. The sight of the brown monsters had broken on him too suddenly. He grasped Beeman's shoulder and pointed, speechless.

"Don't worry," Beeman reassured him with a thin laugh. "We keep them caged."

One of the tarantulas disengaged itself from the group of a dozen or

so and slithered across to the front of the cage. Seizing the wire with its forelegs the beast shook it suggestively. Hanback stared in wide-eyed amazement.

"They're very savage," Beeman commented. "But that's not all. Watch this." Hillegeist approached, and tossed a chunk of raw meat into the adjoining enclosure, separated from the first by a hinged gate about a foot square. Without hesitation the spider crossed to the door, pulled it open, and scrambled through. In the faces of the advancing group the creature shut the gate and secured it with a catch on the other side. It fell on the meat with growls and hisses.

"Why, hell's bells!" Hanback fairly shrieked. "That—that thing THINKS!" He shrank back.

"It has elementary reasoning power, yes," Beeman agreed without emotion. "They become much more intelligent with each generation, and also as they grow older. These are quite young, and not developed mentally . . . Come, you've had enough, I see. Let me show you how we store the eggs."

Unable to take his eyes from the strange scene, Hanback, looking over his shoulder, watched. The creature, now satiated, unfastened the latch to allow the others to enter and struggle for what remained of the meat.

They crossed to the cold-room. In glass jars of two-gallon capacity myriads of small white globes were packed.

"We're producing about ten thousand every month," Beeman explained. "There are nearly a hundred thousand in here."

"A hundred thousand?" Hanback echoed. "And each will produce a thing like you have out there? What in the world are you going to—It

can't be that . . . never!" He seemed to be trying to convince himself of some great mistake in judgment.

"I'm afraid you're right," Beeman said. "We *do* intend to spread them here and there at strategic points. They will multiply faster than they can be killed—much faster, in fact, than they do here, because we keep down the number by natural selection. Add to that, a more highly developed state of their cunning and craftiness than you see here, and—" he paused dramatically—"you can visualize the next masters of the earth!"

The announcement stunned Hanback for a moment. Then he found voice.

"You can't! You can't!" he shouted. "I'll have it stopped!"

"UNFORTUNATELY, Doctor," Beeman reminded him with mock deference, "you can't leave here—until it is too late. We have no intention of doing away with you personally, I assure you; our successors will attend to that. Though the originals were not especially venomous, believe me that these are so, by virtue of their much greater size."

"But you can't do it!" Hanback insisted. They'll want to know where I am—" He stopped, remembering.

"Quite right, my young friend," Beeman continued. "You won't be missed for a matter of months. By then—"

Hanback shrugged, resignedly. "Very well, then. Have it your way," he said quietly.

"I trust you will not object to being locked up at night, Doctor?" Beeman persisted.

"I suppose not, if it's a part of the game."

"Unfortunately it is."

SHORTLY before sunset that evening Hillegeist made his routine examination of the cages. Unlocking one of the smaller groups, he did not notice the tawny form huddled in a corner nearby until it leaped at him through the open door.

"Help! . . . Beeman—Winslow! Bring your guns, quick!" he yelled.

They rushed out, to find him dodging and striking at the beast with a short staff. He laid it low, but not until he had been bitten in the left forearm.

Hanback joined in the battle with the four other spiders that appeared. Winslow and Beeman shot one each. Hanback, with two swift blows of Hillegeist's stick, which the injured man dropped as he jumped to close and lock the door, disposed of the other two.

Beeman gave him a covert look of admiration. But there was no time to be lost; Hillegeist was in real danger—and his services were still of value to them.

As they hurried to the living quarters with him the short tropic twilight faded, and night seemed to snap around them. Even the nerveless Beeman shuddered to think of the great spiders hunting them down in the darkness. He forgot that it was his own plan; they had decided on a less gruesome extinction for themselves.

The antivenin that Beeman kept for just such emergencies he had prepared from theory only; he had no chance to test its effectiveness. He lost no time in injecting what he considered a full dose into Hillegeist's arm. Hanback assisted when necessary.

By this time Hillegeist had become delirious and violent. It required two of them to hold him. They took turns

for several hours. Gradually it seemed that the serum was taking effect; Hillegeist quieted down and slept. Exhausted by the effort and anxiety of the battle to save Hillegeist's life temporarily, Beeman and Winslow dozed off, likewise.

The latter awoke first; already the sun was high. Hillegeist opened his eyes soon after. Aside from shock and weakness, and stiffness in his arm, he seemed little the worse for his experience.

Winslow held up a hand for silence, then ran to the window. He returned and shook Beeman.

"Wake up!" he exclaimed. "There's trouble coming!" Beeman jumped to his feet and joined Hillegeist at the window.

It was true enough. While the others slept Hanback had escaped to the prison colony and returned with the patrol boat. A detachment of French Colonials advanced up the hill, with Hanback beside them.

Hillegeist was seized with a last idea. Struggling across the open space, he approached the main compound to open the gate.

"Drop him . . . Fast!" Hanback yelled. The officer in charge gave a sharp order.

The sound of a shot crashed out, and Hillegeist pitched forward. His final gesture had failed.

Beeman, Winslow, and the still-silent Chinese surrendered.

Hillegeist's death, together with the affairs of the preceding night seemed to have touched a hidden spring in Beeman's make-up. A marked change had come over the man, and his interest in the averted plot to destroy mankind collapsed. He paid no attention while Hanback directed the work of destroying the

spiders and their eggs. Beeman's records alone he preserved.

The three captives were taken to the mainland, but could be charged with no definite crime, aside from possible conspiracy. As yet, they had done no harm that could be established. Even with the evidence available, a jury would have laughed the case out of court as absurd.

Later in the day Winslow came upon Beeman and Hanback talking earnestly together on the steps of the administration building at Tonat. He heard Hanback remark that Beeman's possibilities as a serologist were unlimited. It was a different Beeman than Winslow had ever seen, as his former employer extended a cordial hand.

"Dr. Hanback and I," he explained, "are returning to the hospital. I've decided to remain there permanently. If you need any help in getting yourself established we could find a place—"

"Thank you. I expect to be going back to the States. My wages will be useful, after all. From what I hear there are possibilities open in my line now."

THE narrator stopped, and leaned back in his yielding chair in the club car. He was a young man, but already graying, and with lines creasing his forehead. Nobody spoke for a moment.

"Most fantastic, indeed; somebody's imagination must have got the upper hand on him," a smug and paunchy man in the group volunteered. "By the way—where did you hear the story?"

"I didn't hear it," the narrator finished quietly. "I'm Carey Winslow."

DISCUSSIONS

In this department we shall discuss every month topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine.

A "First Letter to Any Magazine." We Hope It Will Not Be the Last

Editor, AMAZING STORIES:

This is my first letter to any magazine, but the February 1937 issue deserves my praises. Every story was good. Even Stanton Coblenz's story "Denitro" was good. Although it didn't measure up to his "Sunken World" which I think is one of the best, in fact the best that I have ever read.

Keep up the good work and you will soon be top-notch in the Science Fiction World.

If this letter gets into Discussions I'll welcome letters from pen-pals the world over, and I'll answer every letter I receive.

Just one brickbat before I close. Please tone down the colors on the cover. Sometimes the cover is so gaudy I hate to have anyone see me with the magazine in my hands. At other times very beautiful covers, which I am proud to show off.

ROBERT DONOVAN, JR.,
1219 Halpin Avenue,
Cincinnati, Ohio.

(We have recently in one or two instances feared that our Cover Pages were perhaps a little too somber. It is hard for an artist to please every one. The colors in the last cover were almost too subdued.—EDITOR.)

Some Criticisms of an English Author, Mr. Fearn, Who Has Written Many Stories, Several of Which We Have Published

Editor, AMAZING STORIES:

May I thank you for printing my first letter to you. I also wish to state that my request for correspondents, via this magazine, brought very satisfactory results; I have established contact with three boys, each possessing a high degree of intelligence and the scarce knack of letter-writing. Thank you again.

It looks as tho my counter-attack upon one Charles Pizzano has quelled his bellicose, arrogant spirit, temporarily at least, for I find no indication of further argument.

Evidently "Wild Bill" Hoskins' onslaught on John Russell Fearn aroused as much controversy among other readers as within

myself, for there were quite a few manifestations of disagreement in Discussions, among them an epistle from the author himself. Said author certainly defended his rights in an admirable manner. However, I'll go halfway and admit that Mr. Fearn *does* stress the fiction in his stories, which, by the way, only infrequently fall below the border of excellence; but I doubt if more than one tenth of the readers of science fiction read them for the theories propounded therein—on the contrary, the average reader reads the so-called "science fiction" for its allowance for free play of the imagination. Believing myself a typical reader, it is safe to state that more pleasure is derived from the perusal of logical fantasy than from the reading of an accurate scientific treatise.

The same goes for Isaac Nathanson's "A Modern Comedy of Science." Morey's illustration was very good, if somewhat grotesque.

Morey tried very hard, but did not quite succeed in making the illustration for "The Pygmies of Phobos" acceptable. The main reason for this was the almost total absence of perspective. The story, while well-told, was extremely illogical and unconvincing. Even if the people of the year A.D. 2500 were as unhappy as the author tried to make us believe, it is improbable that they would go to the trouble and expense of constructing a tower of such unusual proportions merely to find whether or not there was intelligence on other planets. Another thing—even with their advanced engineering methods—a building whose height exceeded many times the highest altitude of any yet constructed by engineers would certainly take more than nine years to complete. Nineteen years would be more like it. After they did complete it, there wouldn't be one chance in a million of receiving a radio message from an alien intelligence. Presuming that that highly improbable incident did occur, how would such communication be translated, and even then what good would it do them? The novelty of interstellar communication would wear off within a year at the most, and then what use would the 120-mile-high building be to them? There

were many other law-of-chance-defying incidents which are too numerous to recite.

Well, Editors, keep up the good work—you certainly have made a much-needed improvement in the publication. The only thing that I ask for is a return to the large size, a quarterly, and a variety of artists—while Morey is good, any artist, no matter how excellent, may become monotonous.

WILLIS C. CONOVER, JR.,
280 Shepard Avenue,
Kenmore, New York.

(An excellent bit of criticism which adds interest to "Discussions." Mr. Fearn seems to be rapidly acquiring a high status among science-fiction writers.—EDITOR.)

A Friend of AMAZING STORIES Gives His Views On Various Phases

Editor, AMAZING STORIES:

The cover on the December, 1936, issue marks improvement on the part of Morey. The general run of cover drawings for '36 has not been up to standard, lacking both idea and color in the drawing, but the latest one certainly is refreshing. A good cover makes one open the magazine with a feeling that he is about to read an excellent issue. The cover drawing is always the first part of the magazine to be seen and a bad one often would cause a reader to briefly glance through the stories and say—"Not so hot, this time. Don't feel like reading anyhow. Guess I'll phone Joe and find out what he's doing to-night."—And so the new issue of AMAZING is tossed freely into a drawer where it remains until the supposed reader has courage enough to try it again. However, the story is rearranged when the next issue arrives, supposedly to be the December '36 one. Then, Mr. Reader raises an eyebrow and muses—"Well, this is more like it. Looks like I'm in for a bit of good reading. The cover appears interesting. . . . I better tell Joe to pass up the model rocket plans for to-night."—Then maybe Joe is attracted by the magazine also and soon the science fiction has a new reader. More power to your covers, Mr. Morey. The December one is swell.

The Editorials are very interesting. How about another one on the subject of printing, like the two about type and paper in the September and October numbers of 1934. They were A-1. For example, why not write one on how AMAZING is printed and assembled? Also, astronomy articles are very welcome.

The story "Devolution" was rather a disappointment after reading "Intelligence Undying" last spring. Hamilton seems to rise

and fall, but he will always be a favorite with me, just the same.

I would like to make a few suggestions which of course in my opinion would be for your benefit if accepted. Try to obtain Donald Wandrei, Eando Binder, Nat Schachner and Murray Leinster. That is quite an order, but it tells whom I would like to see in AMAZING. Also, give us more stories like "Intelligence Undying," "He Who Shrank," and "A Modern Comedy of Science." Never mind the requests for large size. The appearance of AMAZING now is sufficient if not excellent.

More success to you and your magazine, Mr. Editor. As I said in a previous letter, keep A. S. advancing toward new heights.

JOHN CHAPMAN,
1521 Como Avenue, S. E.
Minneapolis, Minnesota.

(AMAZING STORIES is doing very well at present and letters like yours do much to help us on our way. If you watch our authors' names in the successive issues, you will see that we have the favorites of many readers. The fact that the magazine is a bi-monthly cuts the number of authors in half.—EDITOR.)

We Can Only Say We Are Glad You Are Here Again

Editor, AMAZING STORIES:

Here I am again, and as I am here I might as well give my criticisms, pro and con, of the December issue of AMAZING STORIES.

First of all I must shower Leo Morey with praise for that magnificent cover illustration. It is probably the best he has done since the Aristocrat of Science Fiction degenerated into the present small size. The scene is a very good one. (I always did prefer a picture of the interior of a rocket ship to other picturizations.) Why, the figures even look realistic for once. The image of Zurek in the television should make any girl's heart go pitty-pat. Aside to Mr. Morey; keep up the good work!

And now we come to the stories. As a whole they were good, but "The Time Control," by Philip Jacques Bartel was the best. Now that I think of it, the aforementioned story was very similar to a yarn published a few years back. I believe it was entitled "When Time Stood Still," but I can't recall the author. Pardon me while I proceed to my treasure chamber, where all my science fiction magazines are kept, and I will endeavor to find the author's moniker. . . . Here I am back again and guess what? The author who wrote "When Time Stood Still" is none other than our friend, Mr. Philip Jacques Bartel! Although the stories are

different in the action and plot, the very same method of time-traveling, or should I say "time standing still" is employed. The same characters also appear. Maybe Mr. Bartel is planning to write a series based on the same idea; if so, go to it!

Bob Olsen's contribution, although not up to his usual standard, is worth reading. Speaking of Bob Olsen, reminds me to ask for some more of those fourth dimension stories, such as "The Four Dimensional Escape," "The Four Dimensional Auto Park-er," and others similar.

"Devolution," by Edmond Hamilton is almost tie for first place. The idea imparted is very original and refreshing after reading a story with a plot like "The Space Marines and the Slavers." Although the idea is a little far fetched, I liked it. Incidentally, I have had a story with the same name, but a different plot, published in a science fiction fan magazine.

The two remaining stories were only fair. I would especially like some stories by Philip Francis Nowlan, Stephen G. Hale, Jack Williamson, A. Connel and last, but surely not least, Dr. David H. Keller, who wrote some of the most outstanding s-f stories ever written. The one which remains in my mind is that masterpiece "Life Everlasting." I'll wager you didn't receive one derogatory remark concerning that story.

ROBERT A. MADLE,
333 E. Belgrade St.,
Philadelphia, Penna.

You will be glad to know that Dr. Keller has with us a story written in his usual characteristic way and which will soon appear in our columns. We agree with you completely in all you say about this author's story "Life Everlasting." As we are a bi-monthly we are limited in the number of stories we can give.—EDITOR.)

A Letter from a Very Young Reader with Excellent Criticisms, but Very Positive—a Characteristic of Youth

Editor, AMAZING STORIES:

I am a boy of 13 years and I have derived much pleasure and knowledge from the stories and discussions of readers in your fine magazine. Particularly am I partial to that great science-fiction genius, John W. Campbell, Jr., I consider him, along with H. P. Lovecraft, a fitting successor to the greatest of them all, who, like all great masters, has left us, Stanley G. Weinbaum.

Considering as I do the financial difficulties that editors have had to combat within the past few years, I cannot assume a feeling of bitter sarcasm and irony toward you,

Dr. Sloane, as I note so many of your readers have done. I am sure that you give us the best you can, and, although it cannot quite equal the quality of a more financially fortunate magazine, it is of high quality.

Your February, 1937, issue was a remarkable improvement over the past two books. Upon comparing the well-drawn and color-perfect cover of the February issue with that of the blotchy, smeared generally imperfect October, 1936, issue, I could have solemnly sworn that the same man did not paint both covers. I would advise, however, that you get another artist for interior work. Mr. Morey is excellent for cover painting, but his pictures in black-and-white are somewhat imperfect.

Your best stories from October, 1936, to date were "Uncertainty," by John W. Campbell, "The Council of Drones," by W. K. Sonnemann, "The Outpost on Ceres," by L. A. Eshbach, "By Jove," by Dr. Walter Rose, "The Planet of Perpetual Night," by John Edwards, "Prometheus," by Arthur K. Barnes, and, of course, your highly interesting and educational editorials, Dr. Sloane. "Denitro," by Stanton K. Coblentz, and "The Last Neanderthal Man," by Isaac R. Nathanson, were decidedly out of the science-fiction class, and it would take some imagination on my part to even class them as fantasy. I gather that that "cave-man yarn," "The Last Neanderthal Man," was slipped in under the pretense that it was "Evolution," or maybe "Anthropology." Please, dear Editor, don't turn away readers by publishing such bunk as those two were. Everybody knows that the Cro-Magnon race was certainly not as highly developed in facial appearance as Mr. Nathanson would have us believe. I was always under the impression that the Cro-Magnons were but a step higher in evolution than the Neanderthals, who, incidentally, were not men at all, but a highly developed kind of anthropoid. Certainly not a single Cro-Magnon has or rather had "long brown hair." Common sense would tell us that their hair would be coarse and jet black, the features probably distinctly human but probably very ugly, and in general, more resembling the American aboriginal than any other living race. Where does the science of evolution or anthropology come into the slaying of Neanderthals, cave-bears, and the like?

In closing, I would like to say that any letters from high school students in their last two years, or Freshmen in college, will be welcome, and will be answered by me personally and promptly. I would prefer to hear from young men interested in astronomy, astrophysics, chemistry, physics, geology, or in fact, almost anything connected with sci-

ence or scientific endeavor. I shall continue to read and enjoy AMAZING STORIES for many years to come.

HENRY H. TOWNSEND, JR.,
Route 1,
Media, Pennsylvania.

(It is not often that we receive so good a letter from so young a correspondent. We find that you are a little too positive in your views of the characters in the story. You will not be so sure of yourself eight or ten years from the present time.—EDITOR.)

An Elaborate and Well Thought Out Letter. It Is Good Reading

Editor, AMAZING STORIES:

Concerning AMAZING STORIES in general and the February issue in detail I wish to get the following load off my mind:

When one compares this issue with the corresponding one for 1936 an unmistakable improvement is noted. A few months ago when I began reading AMAZING regularly I felt that it was worse than it had ever been. But the only issues I had ever read before then were those prior to 1931. Now, however, I know that during '33 and '34 you had reached a low standard but now were improving steadily. So, while the present issues are not as good as the ones in the early days of science fiction, they are decidedly better than those of the past few years.

Now about this issue: The cover is good, that is, good as "monstrosity" covers go. It could have been much worse had not Morey chosen his colors so well. I always have liked Morey. He is one of the few science fiction artists. Of the others Payl is not doing s-f work at present and Wesso is but occasionally in another s-f mag. Too occasionally to suit me. To get back to Morey, his covers are better than his interior work, but in the large size he excelled in both. Get the hint? I, among a couple of others, still hope for a return to the original format.

Your editorial was, as usual, very interesting. Let nothing ever stand in their way. As it is, every once in a while, another magazine prints a series of science articles, but we are always sure of getting a scientific editorial in AMAZING.

I started reading "Prometheus" with the idea that I wouldn't like it. Needless to say I received a pleasant surprise. I hope that Mr. Barnes didn't wish the science in the story taken too seriously, though. As you will receive many letters, stating that it contained the very time-worn plot of the scientist creating some monsters which kill half of the world's population, only to devise some method of exterminating them

and thus becoming a hero, I will refrain from saying it.

There isn't much I can say about "Denitro." Better than the usual run of future war stories but not up to Mr. Coblenz's usual standard.

Aside from "The Last Neanderthal Man" I have read but one story by Nathanson, which was "The Conquest Of Earth," AMAZING, April 1930. Having thought so much of the latter I was disappointed in Mr. Nathanson's story this month.

Now that you are published bi-monthly will you please stay that way for a while? It gives my pocketbook a breathing spell and also enables me to acquire a few back issues. The quarterly is a good idea but for one thing; \$2.00 a year is quite a load to add to our science fiction expenditures. Especially so for the fan who attempts to buy all current issues. And when you add to that the cost of four more letters a year—oi, such a business!

While I'm on the subject of finances may I make a comment on a letter that was printed in this month's Discussions? If AMAZING's price were doubled I would probably continue to buy it, but please, Mr. Saari, don't give Mr. Ellmaker any such ideas!

After one or two letters in Discussions you express your belief that "comparisons are odious." Frankly, I see no harm in printing the names of other publications in your pages. Neither is there any good reason for it. Practically all fans recognize the magazines your asterisks and x's represent. The three s-f mags all follow different policies, so as to render impracticable any comparison. In my opinion AMAZING prints the better class of stories, one of the others is inclined toward the "blood 'n' thunder" type while the third strikes a medium between the two. Even though they are all of the s-f class it is difficult to make comparisons among them. What I am trying to get at is that if each fan were to buy but one magazine there would be a group that would definitely stick to AMAZING and the same for the others. I see no harm in saying that I would be in the former group.

Do you remember commenting, in the pages of Discussions, on how your authors stand by you? One fan read that and then proceeded to write to another mag saying that this fact was true because no other magazine would print stories like this. Some of the best authors of this mag are John Russell Fearn, John W. Campbell, Jr., and Neil R. Jones. All three of these write for AMAZING, too. Henry Kostkos and Jack Williamson also write for both. One of the best stories to have been printed in this other magazine (it would be much more conven-

ient if we were allowed to use names) was one of the "Skylark" series. However, the other two stories of this series appeared in *AMAZING* as have others by Dr. Smith, among them is "Triplanetary." I believe that I have, in the foregoing paragraph, disproved what this fan said and, too, I have shown that all of your authors do not stay with you.

Also in Discussions (Feb. issue) a reader in comparing the August issue of *AMAZING* with the same issue of magazine "X" (Astounding in case you feel like printing it) said that X had a novel, two novelettes, four short stories, a serial and a science feature. He gave *AMAZING* credit for having two novelettes, one short story and a serial. In the first place *AMAZING* does not classify its stories as to novels, etc. I believe that your two "novelettes" were each as long as X's novel. In fact X is not very consistent in what it terms novels. In one issue it had a novelette longer than the novel. Or, I might say, the novel shorter than the novelette. As for X's science feature, did not *AMAZING* have a scientific editorial? Well, how about X's editorial? Mostly advertising, anyway *AMAZING*'s "In The Realm of Books" would equal it. I'm not saying anything against X. I read and like it. But, I dislike seeing anyone, solely because of his personal likes and dislikes, say definitely that one magazine is superior to another. The fact that this fan prefers short stories to longer ones has little bearing on the merits of one mag against another.

Now I shall get down to the more serious business of telling what, in my opinion, would improve *AMAZING*. As I have already mentioned, I am in favor of the larger format. In a previous letter I told you several reasons why you should change, so there is no object in doing so now. I feel confident that if a vote were taken the large size would come out on top. Next; keep Morey. If you wish to get some one else to alternate with him on the interior it's all right. If possible, get Frank R. Paul. Smooth edges do make a great deal of difference. That's a point in favor of "X." I would like to see work by the following authors: Dr. E. E. Smith, Dr. David H. Keller (I see you've already signed him up), Dr. Miles J. Breuer. (I don't think you can get anything by Dr. Breuer, but try anyway.) Well, that's enough Doctors. Could you get anything by Harl Vincent, Francis Flagg or A. Hyatt Verrill? If you get but one or two of those I mentioned I will be exceedingly grateful. Of course you shouldn't forget the modern favorites, but you are doing well along that line as it is. Please keep your serials down to two parts as you have been doing and,

when possible print your long stories in just one issue. In other magazines the serials last four and five months. Waiting that long to finish a yarn is quite inconvenient. Maybe the best thing to do for sake of the mag's success is to throw away all such letters as mine and immediately forget them.

R. A. SQUIRES,
1745 Kenneth Rd.,

Glendale, Calif. (formerly of Ahwahnee).

(There is a friendly or appreciative quality in your expressions of criticisms and in your comments, that make pleasant reading for the Editor of *AMAZING STORIES*. We feel that printing the names of what in a sense are competitors, operates to give a personal touch to our comments and that is something we wish to avoid. *AMAZING STORIES* is following a definite system and it seems to find favor with its readers. There is a need for much thought and consideration, and in spite of all we can do there is always a chance that what will suit some readers will not be acceptable to all. Watch our authors in recent issues and in this one.—EDITOR.)

A Charming Letter from the Pacific Coast Editor, *AMAZING STORIES*:

I capitulate. I had decided not to subscribe when my subscription ran out last Summer, because you leave the edges uncut. But I miss the splendid stories so much, that I am sending in my two subscriptions, one for my sister as a birthday present. I like your magazine so much that I bind them and re-read them and loan them trying to interest others in such constructive reading. The facts contained in each story are very instructive, and one can remember them better when learned in such an enjoyable way. But it is hard to turn the pages when left so rough and uncut. I like especially your questionnaire. I also find very instructive the first article you have in each issue. Only I wish you would print them on one side of the page only and put your ads on the reverse side. Then I could cut them out of the magazine and paste them all in one book together. Maybe you will print one volume containing all these editorials you ever printed and thus give us a chance to buy it. When we receive a new number my husband takes possession of it and not until he has read every word of it, reading until near morning, have I a chance to read it during the day. I close hoping this new year will bring you millions of new subscribers.

MRS. CHARLES BOHAUT,
776 Jerome Avenue,
Astoria, Oregon.

(This letter we have slightly abbreviated, but we must thank the writer for her warm appreciation of our efforts. We wish there were more as pleased with our work as she is.—EDITOR.)

Criticism Well Thought Out Even if a Little Severe; Most of the Writer's Countrymen Like Us

Editor, AMAZING STORIES:

Before I begin "clucking chickens," I must fortify you against them by expressing the pleasure which I get from reading, and criticising your mag. I think its present practice is the result of its consistency in quietly going about its business without such stunts as: counting words per issue; clubs and leagues; and not changing its artist. Even though, personally I consider Paul the better illustrator, by always using Morey, a character has been given to AMAZING STORIES.

I intend to review all the monthly mags which I now possess; but first call to mind the cold classics which illustrated the heights to which science fiction rose. (Incidentally all very ably illustrated by Wesso.) "The Bridge of Light," "The White Lily," "Reclaimers of the Ice," "Paradise and Iron," "The Blue Barbarians," "Islands of Space" and "The Man from Tomorrow" whose illustrator, J. Munson made a brief appearance—(or maybe I'm wrong.) Among others I thoroughly enjoyed "Monsters of the Ray," "Tain of Ekkis," "The Mother World," "The Voice of the Void," "Celestial Pioneers," "Half-mile Hill" and "Extra-Galactic Invaders." These stories will stand reading more than once.

I was singularly unfortunate in not being able to obtain many numbers of the monthly mag before October 1933, but I can remember enjoying "Tumithak in Shawn" and "of the Corridors"; and seeing a nightmare of shining fishes, stars and flashes from some cover.

I have all 1934 mags except January and August. I, like every one else, enjoyed "Triplanetary" and "Terror Out of Space;" but the reprints, although I had not read them before, seemed "small fry" to the usual. "The Lost City" (a wondrous mixture of the old and new) I considered as good as the "Bridge of Light;" but why should the mighty civilizations which have existed so long (and always with a menace) be wiped out immediately the hero, and the rescued Princess leave it. I enjoyed "Subjugating the Earth" because of the original methods employed by the invaders. But this theme, like that of the dictator, who, by science brings peace to the world,—as in "Peace Weapons," is grow-

ing old. Personally I think the rehashing of a story must be harder than writing an original one—although I was very clever at the former while at school. I enjoyed the "Moon Pirate," "Through the Andes" (conclusion very original) and "The Master Minds of Venus." I was disappointed in "Eighty-five and Eighty-seven" by Eando Binder. "The Land of Twilight" was another enjoyable rehash. But "Noekken of Norway" although a clever portrait of Norway savoured too much of monsters. "The Rape of the Solar System" was very crude. "The Sunless World" like all Jameson stories was good, but here again someone was rescued by 21MM392 and his friends. The covers steadily improve, but October's was hopeless. The best are those without the thick outlines.

Morey shows by some excellent figures and landscapes that science-fiction work is not out of his reach. I know that you will reply that you receive letters of appreciation, but that does not alter the fact. And anyway this is just my opinion—a voice crying in the wilderness—I know you'll still keep him on.

Hope! His illustrations for "Measuring a Meridian" were very good, so was that for "Noekken of Norway," although a little rough it expressed the correct feeling of horror and the unknown.

Coming to the year's offering I find some high standard stories. The only stories I thoroughly disliked were those of "Posi and Nega." These I considered an excuse for the author to show a little of his knowledge or his little knowledge. If I want scientific data I use my text-book. I read AMAZING STORIES to enjoy thrilling possibilities. He says himself "and this unlearned pen is getting into deep waters"—perhaps he is modest? "The Contest of the Planets" was excellent.

February was disappointing. "The Island of White Mice" was unusual.

"Earth Rehabilitators Consolidated," "Liners of Time," and "The Inner World" were excellent. The theory of the hollow sphere is very much like one of Edgar Rice Burroughs. How does the author account for volcanoes and would not Thurlow falling through the crust be arrested at the center by gravity, which attracts bodies on either side of the crust?

"The White City" was one of the best stories you have published for some time. The stories you get from Keller are of his old high standard. "The Moon of Arcturus" and "Space War" were very good. "Parasite" was excellent. "The Kingdom of Thought" was excellent, but ended too sharply. "The Golden Planetoid" was very good; I was not much impressed by "The Music of Spheres"

—anyway why drag that in again? "The Never Dying Light" was like "Tain of Ek-kis"—and not so well written. The cover paintings have further improved, the best being March, April and May. The inside illustrations have also improved, but are still a little too dark,—see the "Contest of the Planets" in January—with only a slight attempt at anything like fine shading.

I don't like the idea of the small sketches in "Space War." I do like the reversion to the old comet tail title—the Editorials—the Discussions—"In the Realm of Books" by C. A. Brandt and also his Film Reviews—portraiture of future social systems. My favorite authors are: John W. Campbell, Jr., David H. Keller, Neil R. Jones, A. Hyatt Verrill, Stanton A. Coblenz, Lawrence Manning, J. R. Fearn, Eando Binder. My favorite artists for machines, Paul and Wesso; for landscapes, Morey. I do not like poetry in the Magazine. Your subjects are too big for futile efforts. Does Lothrop's "Evolution" seem grand? Look at the elements Milton can think of to create a world. Lothrop can only think of a sea and jellyfish.

On the whole I like your magazine and look forward to its every appearance, and search the bookstalls at every opportunity for an old issue.

T. S. MORGAN,
139 Fenham Hall Drive,
Newcastle upon Tyne 4,
England.

(This letter, which we have shortened a little tells its story so fully that there is little left for us to say. It is encouraging in its last sentence.—EDITOR.)

At Last We Receive a Disapproving Letter From England

Editor, AMAZING STORIES:

Perhaps after you have read this letter, you will either think I have nothing else to do, or that I most definitely don't like your paper, or perhaps even you may not read the letter, but still I hope that you do.

I have read the rear part of "AMAZING STORIES" time and time again, about the letters from your readers all over the world, and I think it is about time you knew exactly what is wrong.

The person who could sit down and read one of your stories (Yes! only one) without laughing a little should be examined immediately by a doctor. If your tales commenced at a reasonable period, say 1989 or even 2000 A.D. there would be something for the younger generation to take notice of, instead, you write yarns of the world of 5647 or something to that effect. I admit that it is all very interesting to the world's scientists at large

and to padded cell inhabitants but not to the general public. Yes, I know you will say, "Oh yes, but we have a very large circulation etc., etc." but do you know what your readers are, CRANKS, please don't think this is rude, but really I have proof of this statement.

I myself, take a great interest in the future of the world, but not in some thousands of years hence. You have some writers whose work is excellent, but those people of yours who write stories about the advanced stage of man, where he is in such a state of evolution that he is an animal with a mechanical brain, well, that is absolutely the limit.

The best story you have ever had published is the "Inner World" by A. Hyatt Verrill. This story is something to talk about, still I don't suppose we shall ever have another story from him. I hope that some day I shall receive a reply from you, but I myself think that it is extremely doubtful, still I wait.

Wishing the best of luck to your good writers.

ROY F. CHANDLER,
17 Essendine Road, Maida Vale,
London W.9., England.

(It is very seldom that we receive such a disapproving letter as this from a reader in your country. You certainly run counter to the majority of our correspondents. We never say anything about our circulation in "Discussions." Only a limited number of the letters we receive from readers can be published from consideration of space, so you have no basis for your assertion about the character of our readers.—EDITOR.)

Stories From Our Pages Asked For Editor, AMAZING STORIES:

At various times you have published in your magazine, AMAZING STORIES, stories by E. E. Smith, Ph. D. and John W. Campbell, Jr.

Notable among these stories were the "Skylark" series and the series terminating with "Invaders from the Infinite."

If these are published in book form where may I obtain copies of them?

Please let me know as soon as possible so that I may place my order.

ROBERT POSEY,
15 North Salisbury,
West Lafayette, Ind.

(The stories you ask for are not published in book form. You might procure them from dealers in back number magazines. Several dealers in back numbers advertise in the Literary Supplement of the New York Times, New York, N. Y.—EDITOR.)

An Appreciative Communication From Australia From An Old Time Reader

Editor, AMAZING STORIES:

Nearly every reader of AMAZING STORIES digests the Discussions columns. Criticisms, which are at first funny, soon become tiresome. I wonder how many of your critics, well-meaning and otherwise, realize that there must be many thousands of readers who remain silent—apparently satisfied. They remind me—the critics I mean—of the soldier, marching with his regiment, who was the only one in step. The remaining 9,999 being out of step.

In practically every issue of A. S. we read of some dissatisfied person who wants the large size back again, others want Paul, still others, Morey. Some want smooth edges; some, more illustrations, others fewer. Some want one class of story at the exclusion of another class, and *vice versa*. Really, the long list of "moaners" seems to be those who are "agin' the government." Without wishing to make the editors bust their vest buttons, I think that every change that has been brought about is, if possible, an improvement and not the cause for a series of yelps. Don't worry about your competitors. I have read one or two of them, but—well, I won't say anything, except that I have only read one or two of them, although every issue of A. S. since Vol. 1 No. 6 has reposed in my magazine rack, and there are a good many of the same mind as myself. Believe me, A. S. is "tops."

In case this letter should appear in Discussions, I wonder if there are readers in any part of the world, who would correspond with me. I promise to answer all who write.

In closing, let me wish you the best of luck.

F. G. KNIGHT,
7 Blaxland Court,
Warners Avenue, Bondi,
Sydney, Australia.

(It is quite interesting from our point of view to observe how our Australian readers practically always write such encouraging letters to us. We are unable for lack of room to publish more than a small proportion of our mail from the Antipodes.—EDITOR.)

A Good Record in Finding Correspondents Through Discussions

Editor, AMAZING STORIES:

Just a line to thank you for printing my request for correspondents some time ago, and to inform you of my success in search-

ing for science-fiction pen-pals. I wish you would print this in Discussions as evidence of the true help AMAZING STORIES can be in obtaining correspondents. Through that request in A. S. I have made friends in Seattle, Washington; Charlestown, Massachusetts; Staffs, England; Brooklyn, New York; Edinburgh, Scotland; Adelaide; South Australia, Durban, South Africa; Sydney, Australia; and Johannesburg, South Africa. More letters come in every day.

Unfortunately, however, I have had to cut down on some of my letters; else I could not have made my science-fiction fan magazine, Science-Fantasy Correspondent, the great success it is today as a valuable and fascinating handbook for the fantasy fan.

WILLIS CONOVER, JR.,
27 High Street,
Cambridge, Maryland.

(We are quite proud of this evidence of the success you achieved through "Discussions" in getting "pen-pals" as they are called. We hope you will keep up your correspondence.—EDITOR.)

A Bit of Scolding Made Almost Pleasant By a Bit of Appreciation

Editor, AMAZING STORIES:

I have just finished the February edition of AMAZING STORIES and think that it is the best issue in a long time. The new serial, "By Jove," is POSITIVELY the best serial that you have published since the "flop" of AMAZING STORIES a couple of years ago. If the February issue is a standard that you are going to set for the next six issues of A. S. you may rest assured that you will sell at least six copies of A. S. in 1937.

Your feature novel "The Planet of Perpetual Night" was not only an "A plus" story in itself but it also presented a novel idea. "Prometheus" impressed me quite favorably. "Deniro" was also a good story. "The Last Neanderthal Man" was a good story, but it didn't belong in A. S., it should have been in an Adventure magazine.

T. BRUCE YORKE,
157 N. Alexandria Ave.,
Los Angeles,
California.

(The story "By Jove" ought to be good as it came many miles to us, namely from South Africa. As far as the readers are concerned we know that the circulation is increasing. So we will go peacefully along and will be glad that others of our group are doing well.—EDITOR.)

South Africa Writes Us a Very Pleasant Appreciation. We Hope That We Deserve It

Editor, AMAZING STORIES:

I have been reading AMAZING STORIES and other Science-Fiction magazines for some months now. In fact, I have become quite an ardent "fan" and have started to scour the country for back numbers and old copies. They are difficult to obtain and so far I have only succeeded in getting a dozen or so up from Capetown. The only way to make sure of a regular supply of future issues out here is to subscribe through a news-agent, and this I have now decided to do.

I first came across a copy of AMAZING three or four years ago, and enjoyed it enormously. Since then odd copies have come my way—far and few between, though very welcome—but I have read enough, I think, to enable me to form an opinion of your magazine. As I am a reader, and about to become a subscriber, I do hope you print this letter in your discussions columns.

I always read the discussions with great interest—they are a valuable feature of the magazine. The majority of your correspondents seem to be Americans and Britishers, so perhaps a letter from a South African will afford a new viewpoint.

To me it is always surprising to find readers thoughtlessly and arbitrarily demanding that a certain author be dropped, or flatly stating that such and such a story should never have appeared. Cannot they understand that the magazine is not written solely for their own personal enjoyment? What does not appeal to one reader will very probably send another into raptures. This may be elicited from even a casual reading of any month's "Discussions." For goodness sake, leave the selection of stories alone. The Editor is best qualified to do this. After all, it is his job, and he does it very well too! AMAZING STORIES always offers variety, and I am sure every issue contains something to please everybody. Expressing opinions, personal tastes, likes, etc., and offering suggestions are quite in order. This is encouraged, as we know, and must prove of value to the Editor, but all wild demands, empty threats, and mere "slanging" is stupid.

Personally I prefer Interplanetary and "Space and Time" stories. I thought "The Fall of Mercury" by Leslie F. Stone an excellent bit of work. "When the Meteor Struck," in your June issue was a refreshing little yarn from an unusual angle. "Beyond the Stratosphere" seems new in conception, and I am awaiting the second part with great interest.

Your artist, Leo Morey, does some very fine work. I like his covers. I think his black

and white work is criticised simply because "familiarity breeds contempt." For this very reason it would be a good idea and a wise move to have one or two other artists do some of the illustrations. There would then be no talk of Morey getting "stale," and we should have more variety, which after all, is what everybody wants in any magazine. More illustrations too, would be appreciated.

The type is large and therefore very readable. No complaints! The size, too, is just right. I remember reading one or two AMAZINGS when the size was larger, and I really do think the smaller size an improvement. It is definitely better for collectors, being "firmer" and eminently suitable for placing in a book-case or shelf.

And now—the question of trimmed edges. Here I am sure everybody is in complete agreement. We know that the stories are the vital consideration, but there is something to be said for appearance. The rough edges DO look "cheap" and one is reminded of horrible 10 cent "Blood and Thunders"! The "Aristocrat of Science Fiction" should live up to its name. Apart from the attractiveness of neatly trimmed edges, the practical advantages are worthy of consideration: ease in turning over pages—longer life for the cover, and much joy for the numerous collectors who would be able to stack their magazines in nice even, smooth, rows on their shelves! The consensus of opinion here should, and I hope will in time, receive the attention of the proprietors.

If I may, I would like before I close, to express a desire to hear from readers anywhere who would like to write to me. My age, 26 (twenty-six); profession, music teacher; hobbies, reading, music, and photography. I would much appreciate any old copies of Science-Fiction magazines prior to 1936 (AMAZINGS prior to 1935), and can send in exchange South African illustrated magazines or postage stamps. Will answer all letters, and hope to get some replies to this invitation.

Best of luck to AMAZING STORIES—may it get better and better! Oh yes, and a special word of thanks to you, Mr. Editor, for the very interesting and informative Science Editorials. When can we have one about relativity and the "fourth dimension"?

SONNY KLEU,
P.O. Box 185,
Oudtshoorn, Cape,
South Africa.

(So pleasant and appreciative a letter as this is well worth our waiting for it to go half-way around the world before we receive it.—EDITOR.)

A Science Fiction Correspondence Club for Juniors Is Announced in This Interesting Letter

Editor, AMAZING STORIES:

I have a very important communication to give you, and I, as well as several others, would appreciate publication.

The announcement is that a group of boys have formed an association called the JSFCC, or Junior Science Fiction Correspondence Club. The idea of the club is, through correspondence, to unite the younger readers of science fiction, and to spread stf. among the youth of the world. In order to give an idea of what the club is, and how it functions, here is a resumé of the Constitution.

No payment of dues or entrance fees of any kind are required. Membership is limited to those between the ages of twelve and eighteen. The officers are Corwin Stickney, Jr., Director, Doug Blakely, Secretary, and yours truly, Tom Jackson, Asstt Secretary. Officers are elected every December, and assume their duties on January 15 of the following year. Whenever 25% of the members so desire, a suggested amendment to the Constitution at the following election of officers. Every letter received by members must be answered within 10 days. That is a resumé of the Constitution. Or did I say that?

To join this club you write to Doug Blakely, 4516 Edina Blvd., Minneapolis, Minn. He will send you an application blank, if things work out as they are planned, and when you return the blank Doug will send you a copy of the Constitution and a list of members, also your membership card.

When you receive your list of members, you may write as many as you want, from 0 to all. They will write you back again, and thus you will have some one to correspond with, or something. Later on you will probably receive a letter from some new or old member who has read your letter and has decided to write with you, or something. You must answer. The process of becoming a member will probably be less complicated by the time this is printed, I hope.

Well, that's all of the JSFCC for the present. I'll be writing you again in a few months.

Several questions. Why can't we have a Skylark quarterly? How many people will have to write to you before we get a Skylark quarterly? Please tell us and I bet we can get enough petitions in three issues.

Why did you quit the covers by Sigmond?

Also the large issues? How do you call "Hoffman's Widow" science-fiction?

I would like to make this letter longer, but I've got three letters to answer, and a lot of other junk, like homework, to do, so I'll close with the remark that Stickney said in a recent letter to me, "In my opinion, *AMAZING STORIES* is the most improved magazine on the market, today." Oh yes, I agree with him.

TOM JACKSON,
5155 Wornall Road,
Kansas City, Missouri.

(We do not have the right to publish the story referred to, if for no other reason than the fact, that we understand that the author has been endeavoring for some time to have it published in book form. We did not consider that Sigmond's work was suited for the covers of *AMAZING STORIES*. We regarded "Hoffman's Widow" as an interesting study in anthropology. The large size issues of our magazine aroused a great deal of criticism as it was so conspicuous in the reader's hands. We thank you for your good wishes and hope that your club will prosper. We receive a number of letters in which the writers ask for "pen-pals" as they call them. —EDITOR.)

Australia Is Again Heard From in an Interesting Letter

Editor, AMAZING STORIES:

I am writing to you for the first time, to express my appreciation of your excellent publication. I have been a constant reader of "A. S." for three years, now, having begun when a friend, in a moment of expansiveness, passed me a copy to read in my spare time. I have always been very keen, I might almost say, crazy about astronomy, and when I found some stories dealing with this absorbing subject, I began to sit up and take notice. The result now is a standing order for "A. S."

I also read a rival of yours, but as I exchange that from month to month, and yet I save yours, you can quite easily see which I prefer.

And Now, Editor (this is said with a fierce accent, and a grim expression) I am about to throw a brick-bat. Now there's no need for you to start dodging, it's not heading towards you. It is going straight towards certain of your so-called enthusiasts, who are always moaning about rough edges, rough paper, different size, and suchlike petty grievances. I realize that it is only

by adverse criticisms, and a small amount of fault-finding that anything can progress, but when things like this are brought forward, well, all I can say is, it's about time a race from another planet took over the government of this one. Why, hang it all, so long as the cover of the mag. keeps up to its present standard, what on earth does it matter about all that stuff? "A. S." sells itself, in any case. Now there's my opinion, and I don't care who knows it.

Well, after that letting off of steam, we'll get back to the pleasanter side. Let's see you keep up the present standard of the stories and serials you are publishing in the mag., especially the serials. I don't usually like the serial idea, but I do think it's well worth while to have such gems as "Liners of Time," "Earth Rehabilitators, Consolidated," and, to go back a bit, "Terror out of Space" and "Triplanetary." By the way, I have just finished reading the second instalment of "The Stone from the Green Star." I searched all over for it, and at last I found it. All I can say is, them was the days when stories was stories as is stories. Wish we could get some more, even reprints.

And now, before I close this boring epistle, there's one other thing I should like to mention. I noticed in one of our daily papers the announcement that the new 200 inch telescope is at last to be mounted at the Mt. Wilson Observatory. I wonder would you publish in "A. S." as much of the results of this wonderful new instrument as you possibly can. The trouble here is that so little attention is paid to things like this, and usually, a few lines are written in an obscure corner of the paper, making it very hard to get any information on such subjects. If you could spare the space to write an article on it, I'm sure there are many of my fellow readers who will appreciate it.

If possible, I'd like you to place this in your Discussions Column, there may be some reader or other who can give some interesting facts on this new telescope. Incidentally, I'd like to let you know that I am one reader in a thousand. I do not turn to the Discussions Column first, I start from the beginning, and read right through.

Well, here's to you till we have the Martians and Venerians coming to Earth on a peaceful mission,

ALAN LIGHT,
19 Macauley St.,
Leichhardt,
Sydney,
N. S. W. Australia.

(You must have patience in receiving
ws of interest from the starry world,

through the 200 inch lens at Mt. Wilson Observatory. A surprising amount of good work has been done with much smaller objectives.—EDITOR.)

New Zealand on the Other Side of Mother Earth from Our U. S. Writes a Friendly Letter

Editor, AMAZING STORIES:

I have just finished the May 1935 issue, which was a bit late in reaching us here.

"Liners of Time" promises to be a good yarn, but getting down to logic, 2000 A. D. is only 65 years time and it seems hardly likely that the world could advance to such a stage as time travel in 65 years does it? "Posi and Nega" stories I always enjoy. In these yarns, one can learn a huge amount as well as enjoy jolly good reading. "The Gypsies of Thos" was a good story, but the author made a mistake when he created his monsters. Please correct me if I am wrong, but isn't it so that the larger the life on its surface, the smaller the planet? The planet Thos being larger than earth would have smaller people than earthians on it. "Older than Methuselah"—these people were of great intelligence. Well, that given, would they be likely to forget their machinery? Also when our "hero" turned off their heating apparatus, is it likely that people of such high intellect would be so superstitious and primitive to put it down to the "Unseen"? And after our "hero" restored their heat would they claim him as a "savior" when at the commencement of the yarn he was merely an ignorant child compared with the supermen, the "ancients," who could invent ray gun-traps for ships, etc.? "The White City" was decent reading. The whole issue was good, Mr. Editor, and my criticism is only friendly. On the illustrations I offer no comment as too many comments are always flying around and I wouldn't like Mr. Artist to get sunstruck through wearing no hat just because something I may say may give him a swelled head.

Well, here's wishing you, the mag and all the readers the best of luck.

GEO. G. STEPHENS,
552 Worcester Street,
Linwood, Christchurch,
New Zealand.

(Why do we always receive such friendly letters from our Antipodes? Our critical letters, in the severe sense almost always come from readers located near us.—EDITOR.)

A Charming Letter From Wales; the Address Puts Wales in Great Britain, Not in England

Editor, AMAZING STORIES:

After reading some of your rival magazines, I quite endorse the statement that A. S. is the aristocrat of Science Fiction. The covers alone of your rivals are enough to make any sane person bolt in the opposite direction. I have been reading A. S. since 1930 (that was when I could get a copy,) and I still consider it the finest mag. on the market. I have just one adverse criticism to make about the February issue, and that is about the story "The Last Neanderthal Man." I don't think it belongs to Science Fiction at all. It should be in an adventure magazine, however, you can't suit everybody all the time.

MISS ALICIA FEELTHER,
Bay Studio,
Rhosnecsis,
Anglesey,
N. Wales,
Great Britain.

(The story you object to in the last lines of your letter is a scientific study of the development of prehistoric man. Thanks for your good wishes.—EDITOR.)

A Letter of Criticism and Suggestion From Scotland

Editor, AMAZING STORIES:

I should like to write an appreciation of AMAZING STORIES in flowing terms and in "flowery" English, but since my literary talents are small and inadequate, I can only write in rather poor and illiterate English. Believe me, however, it all comes from the bottom of my heart.

"We of the Sun," in my opinion (and I am sure in everybody else's) could have been treated better. It could have been enlarged into a novelette, or even a serial, but as it was, it seemed to leave one in suspense. "Maelstrom of Atlantis" I did not like, for it had a lack of science, but for those who like science adventure (with the strong accent on "adventure") I suppose it was quite good. In the present issue "Lucium Under the Sound" promises to be good. I am a mystic myself—so I expect I will enjoy it. Has it ever occurred to you that even mysticism has a scientific basis? As a Rosicrucian student, I know this for a fact. I should like to see some science fiction stories about this. I do not mean weird tales about vampires, etc., but a real good story

of mystical scientific experience. As an Egyptologist, I would appreciate it if it was about Egypt. I think readers would like a story like that too. "When the Meteor Struck" is quite good, but I think I have had enough of stories of this sort.

About the appearance of the magazine in general. The "Comet Tail" makes the outside front page look excellent, I first bought AMAZING STORIES because I liked the look of the front page. Morey is a very good artist, but I should like to see Paul illustrating some stories. "Discussions" is becoming more grammatical every issue, I notice a letter given up to that subject. I wonder what the writer will think of this letter!

And now, I have to make an announcement about an organization called "The League of Science Crusaders." This has been conceived by me, and the idea is "to help humanity by scientific cooperation." The ultimate aim will be a Scientific World State. Now, I know there are Science Clubs, and Science-Fiction Clubs all over the world striving for recognition, so why shouldn't they all amalgamate in the "L. S. C."? I have the International Science Club and the World Girdlers International Science League Correspondence Club already on my list. Will people interested please write to me for particulars?

To get now to the thing I like best—science. It seems to me that, though time traveling machines and other things which *materially* and *physically* transport a person through time may be impossible, future-scanning machines may become a fact. On the other hand, I have a vague feeling that time does not exist—only change, in which case all the apparent paradoxes may be solved.

As an afterthought, in relation to science-fiction it has occurred to me that H. G. Wells, in his "Scientific Romances" has said that science-fiction ought to have only *one* fantastic or imaginative incident in the story and stick to stark reality after that. I think authors ought to take this to heart.

Trusting to you to "unmangle" this letter, with best wishes for AMAZING STORIES.

JAMES RATHBONE,
c/o Parkhill,
26 Heriot Place,
Edinburgh, Scotland.

(Your interesting letter is quite suggestive. Like others of our correspondents you do not realize that our "science" element covers a very wide field. It is a comfort to receive so many compliments from correspondents.—EDITOR.)

An Excellent Letter from One of Our Younger Readers

Editor, AMAZING STORIES:

From the letters in that section of AMAZING STORIES known as "Discussions" I gather that quite a number of readers did not like the story "Hoffman's Widow" even stating that it did not belong in AMAZING STORIES. I am writing this letter (my first to any magazine) to add my support to those few who enjoyed the story.

AMAZING STORIES is supposedly a science-fiction magazine; then why should not facts, theories and thoughts on any and all branches of science be eligible as bases for its stories. Personally I was very pleased to see this divergence into a new channel. Can it be that your readers forget that the word science, and therefore why not science-fiction, embraces more than physics and chemistry which appear as the bases for the vast majority of this type of story. My own preference is for those science-fiction stories such as "Bare Hands" by Hawthorne Daniel and others which were printed in Popular Science Monthly during '27 and '28.

From my standpoint, the fact that you seem always to try to maintain a variety in the scientific foundations of stories is one main point in your favour. Of all the stories printed in AMAZING STORIES during the past few years that I have been reading the magazine, I cannot recall any which would cause my denouncement of them. Before I reach the faults of the magazine, let me commend you for your consistently interesting and often helpful editorials.

The faults of the magazine, in my opinion, lie only in its appearance, binding and cost. But I am sure you are trying and I admit evidences of slow improvement. I do not like the October 1936 cover in particular and many others. Incidentally I was not in favour of the return to "Comet Tail" title.

I am nineteen years old, so I suppose I am among your younger readers. All branches of science interest me, and, should this letter get in "Discussions," and if anyone, any age, anywhere wishes to write to me for argument or otherwise, I will do my best to maintain my end of the correspondence.

ALFRED FOSTER,
183½ Sherbourne Street,
Toronto, Canada.

(It is a comfort for us to have such a letter as yours, in which you take a just view of the much criticized story, "Hoffman's Widow." It is definitely a study in anthropology, showing the determination of the Esquimaux when fully aroused. It certainly was well told as a tragedy of aboriginal life.

The return of the "Comet Tail" title has been approved by many; your remark is about the first expression of disapproval.—EDITOR.)

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Editor, AMAZING STORIES:

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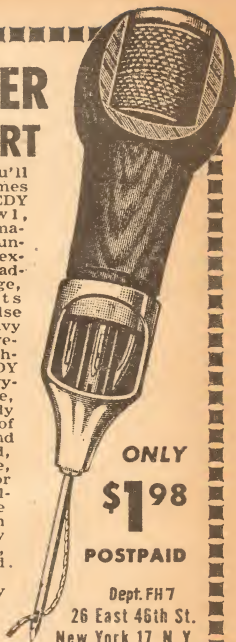
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